SR1066

Harvester

Instruction manual

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Introduction

The purpose of this book is to familiarize the operator with the forest harvester. It is of utmost importance that the operator becomes familiar with the structures, adjustments and maintenance of his harvester. Compliance with the advice and instructions given in this manual guarantees the best results at the lowest costs.

This manual provides descriptions of as well as operating and maintenance instructions for the forest harvester. The other manuals you will find useful when using and servicing your forest harvester include the instructions and spare parts catalogue for the harvester head, the instructions for the harvesting computer, the instructions for the crane, the instructions for the base machine control system as well as the engine manual and the spare parts catalogue.

Have these manuals always in the cab, in the special pocket reserved for them, for convenient reference. If, for some reason, they are not supplied together with the harvester, send immediately for new manuals.

Item ”Technical Specifications” has a description of all the features of the forest harvester in accordance with the delivery contract. It does, however, not include retro-fitted accessories.

The Manufacturer reserves the right to modify the structure, adjustments or accessories of the harvester as well as the service and maintenance instructions without further notice.

Sampo Rosenlew Ltd

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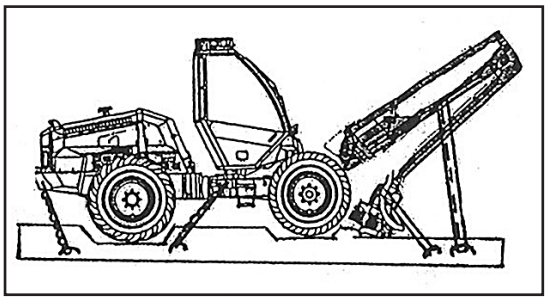
Safety precautions

Read carefully these instructions on safety and use before starting to operate the harvester. The time spent becoming familiar with the instructions now will save you money or may even spare you from injury.

Before accepting the delivery of the harvester, make sure it conforms to the delivery contract. Do not fit the harvester with any accessories not approved of by the Manufacturer. The Manufacturer of the forest harvester is not responsible for any damage or injury caused by such accessories either to people or property. If any information provided in this manual contradicts the laws and regulation of the country in which the harvester is used, local regulations are to be followed.

1. Transportation on a vehicle or by rail

Make sure you know the measurements and weights of the harvester and the transporter. Comply with any regulations concerning transportation.
Use increased tyre pressure, minimum of 3 bar to improve stability.
Fix the harvester securely to the transporter.
For road transport lower the crane fully and fix it to the transporter.

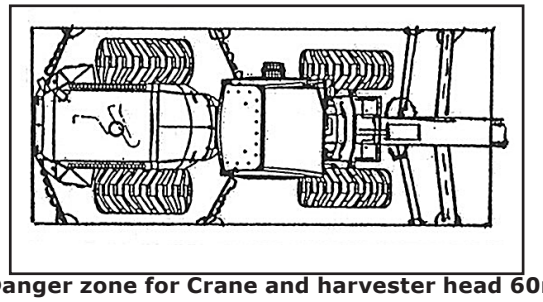


Binding harvester

Slow vehicle sign

2. Driving in traffic

On public roads a transporter shall be used to move the harvester.
Remember that the harvester has articulated steering.
Test brake functions before driving on the road.
Wear the safety belt.
Never drive downhill with the gear in neutral.
Only shift gear on level ground.
Never carry passengers on the harvester.
Never use the harvester for transporting goods.
If the harvester fault diagnostics detects a malfunctioning brake or drive pedal, the driver can still drive the harvester in for a service, but at a low speed and with slow crane movements.



Danger zone for Crane and harvester head 60m

3. Forest harvesting

Get familiar with the structure of the forest harvester by studying the manual before starting harvesting.
Make sure the protective guards are properly attached and in good condition.
Sound the signal to warn people around the harvester before starting the engine.
Never use the forest harvester for anything except harvesting of trees.
Manual feeding of trees into the harvester head is forbidden.
Before starting the engine and moving, make sure nobody is standing too near.
Fasten the seat belt. This is important, particularly when driving across steep terrain.
Test the brakes as soon as you start, and stop immediately if the brakes or steering operate defectively.
Never adjust the seat or joysticks while driving.
Never leave the cab while the harvester is moving.
Never leave the engine running unattended.
Beware of the crane and the moving parts in the harvester head.

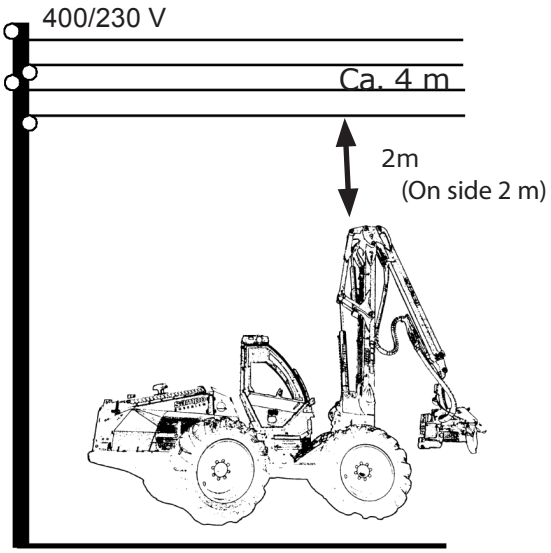
In cold weather heat the oil by circulating it through the harvester head, too, at low revolutions and low pressure before starting work.
Drive carefully on hillsides; the harvester may overturn, particularly with the crane on the downhill side.
The forest harvester cab is a safety cab.
Never saw with the guide bar towards the cab. A loosened saw chain is dangerous and may hurtle through the window.
The harvester has two exits. The left-side door is the normal exit. The right-hand side window may be used as an emergency exit when the lock has been opened.
Always before getting in the cab, open or ensure from the outside that the lock on the right-side door is unlocked.
When the harvester is in use, the emergency exits must be closed. For safety reasons their construction must not be changed. When driving on frozen rivers or lakes, make sure the ice is strong enough. When driving on ice, keeping doors open helps exiting cabin. In this case beware of tight curves that may cause rear tire to hit the door
Note the recommended safety distances when harvesting under power lines.
Stop the engine before cleaning or servicing the harvester.
Stop the harvester and the engine immediately if there is an alarm or any abnormal sounds or smells. Find out the reason for them, and solve the problem before carrying on with harvesting.
If there are leaking hydraulic connections, tighten the connections and wipe the oil off the frame and underpan.
Support or lock the crane and the harvester head before going beneath them.
Never clean the harvester without proper equipment.
When leaving the harvester, lower the crane, stop the engine, remove the ignition key, lock the door and turn the master switch to its zero position.

SAFETY DISTANCES WHEN HARVESTING UNDER OPEN-WIRE POWER LINES

The minimum space between the harvester and power lines with voltage must be in accordance with the enclosed illustration.

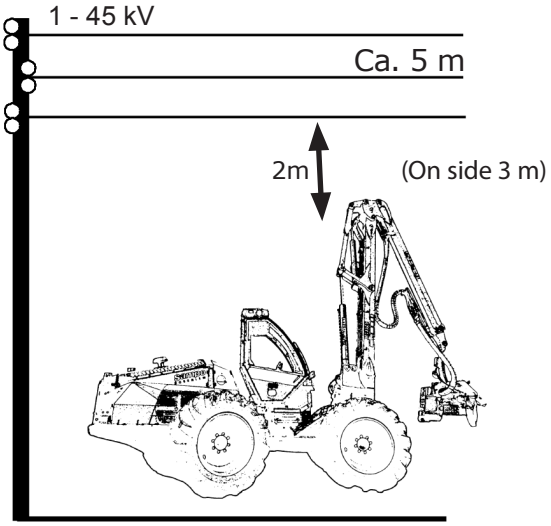
Low-voltage power lines 230/400V can be distinguished from high-voltage lines over 1 kV by the smaller insulators and the fact that there are usually four low-voltage lines. A bundle assembled aerial cable shall be treated the same way as an open-wire cable.

In case the height or voltage of the power line is difficult to estimate, the electrical company shall be consulted.



In case of accident

If there is an accident despite all precautions, keep calm and consider carefully what to do. First try to reverse the harvester away from the power line. If there are other people near, ask them to check that the harvester is not stuck in the line. If the harvester is just leaning against the lines, try to drive it away from them. Follow the advice from the people nearby. Due to their own safety, they shall stay a minimum of 20 metres away from the harvester touching the power line.



If the harvester cannot be driven off, and you have to leave the machine, jump down with your feet together in order not to touch the harvester and the ground simultaneously. Do not make yourself a conductor through which electricity can pass; the real danger lies in touching the harvester and the ground simultaneously.

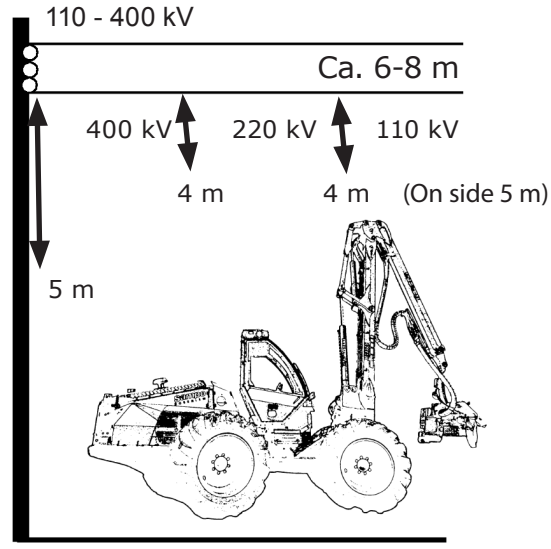
Get away from the harvester jumping either with your feet together, or with only one foot on the ground at a time. Otherwise the electric field on the ground may create a fatal electric current between your legs. You will be safe at a distance of 20 metres from the harvester.

Beware of broken power lines lying on the ground.

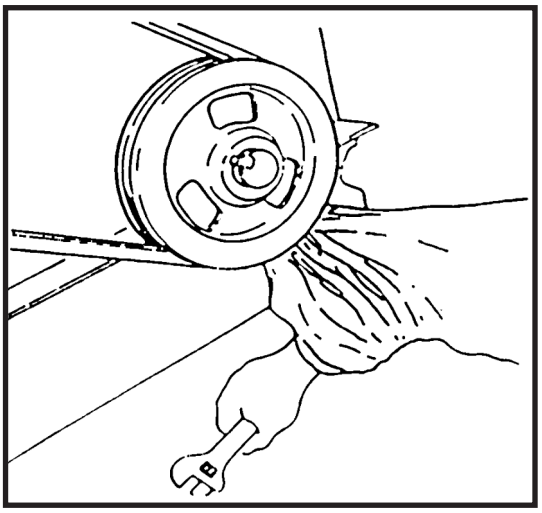
A harvester touching a power line may catch fire. Leave the harvester immediately if smoke starts coming from the tyres.

Make sure the harvester will be guarded at a safe distance. Do not try to get on the harvester even if the power in the power lines may seem to have gone off.

Remember that open-wire lines never have



a ”blown fuse”, but they are always dangerous unless made dead by an electrician. Even if the power went off, it might come back on in a while due to technical reasons. This may be repeated several times.
Contact the electric company and inform them about the exact site of the accident. By doing this, any risk can be eliminated and the fault repaired.
Ask the electrical company for advice and follow it. Inform them about any contact with power lines even if there was no actual damage.



4. Repair and service

Always keep the harvester in good condition. Check the condition of fast moving parts daily. Pay special attention to the transmission mechanism and the rotating parts in the harvester head. Replace defective parts before they become dangerous.
Clean, repair and service the harvester with the transmission and engine off and the ignition key off the ignition switch and main switch off.
The harvester head has many danger points. Read the harvester head manual to familiarize yourself with them. On some models turning of the measuring wheel by hand makes the knives, tracks and rolls close. This is extremely dangerous if the engine is running or there is pressure in the hydraulic accumulator of the harvester head. Do not go near the harvester head, particularly the knives, tracks and rolls, with the engine running.
Before welding, disconnect the battery cables, input cable of the diesel engine control unit (the left hand side cable under the cover of the control unit attached to the engine), all the cables to the PC processor, the cables of the measuring device head module (MCC) and the cab MCI module, connector of the large wiring harness between the frames and the central unit cables of the optional fire extinguishing system.
Always have the earth cable of the welding set near where welding is done.
Do not use inappropriate tools to connect and disconnect the battery.
Do not make an open fire or smoke near the battery.
Handle the battery acids with care.
Do not add air in the tyres without a pressure gauge due to risk of explosion.
Do not add coolant with the engine running.
Do not remove the radiator cap from an overheated engine.
Beware of hot surfaces of the engine and especially exhaust pipe.
Do not refuel with the engine running.
Do not smoke while fuelling.
Do not adjust the hydraulic working pressure without a pressure gauge due to possible injury and damage to the components.
When servicing the hydraulics, be aware of the high pressure in the system. Make sure there is no pressure in the system, not in the head pressure accumulator, either, before disconnecting the connectors.
Never use over-sized fuses; they involve risk of accident.
Never start the harvester with anything but the ignition key.
When refitting a wheel, tighten the fixing screws to the correct torque. Do not make any such structural changes or additions to the harvester that would make it less safe.
Tow the harvester only from designated points.

5.Local laws and regulations

Before driving the harvester on a public road, make sure that harvester is correctly equipped and applies to the local regulations and laws given for such a vehicle.

Machine operator have to be trained to drive and use harvester safely.

This symbol in The manual refers to a special risk involved in taking a certain measure, due to which extra caution shall be practised.

6. Fire safety

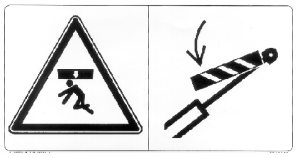
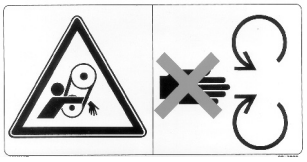
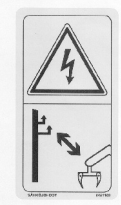
Two factors are needed to start a fire: flammable material and ignition. Oxygen is always available. In the forest highly flammable dust accumulates in and on the harvester. Clean the harvester periodically. Oil and fuel leaks also increase the risk of fire. Repair any detected defects immediately. The engine and the exhaust pipes, the electric system in case of a short circuit and overheated brakes pose a real risk of fire.

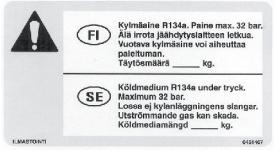
The harvester comes with two 6-kilo hand extinguishers. They are stored above the rear wheel inside the side guard that opens rearwards. The extinguishers shall be inspected every 6 months by an authorized service outlet.
The harvester may be equipped with a semi-automatic fire extinguishing system. Make sure to comply with the manufacturer’s instructions when using the system.

Marking of danger points

Although an effort has been made to build the forest harvester as safe to use as possible, there are certain risks involved in its use. These are to be kept in mind when operating the harvester.
The danger points have been marked on the harvester using danger symbols. On the following page you will find the key to these symbols. The danger symbols are based on the international ISO 11 684 standard.

Danger symbols

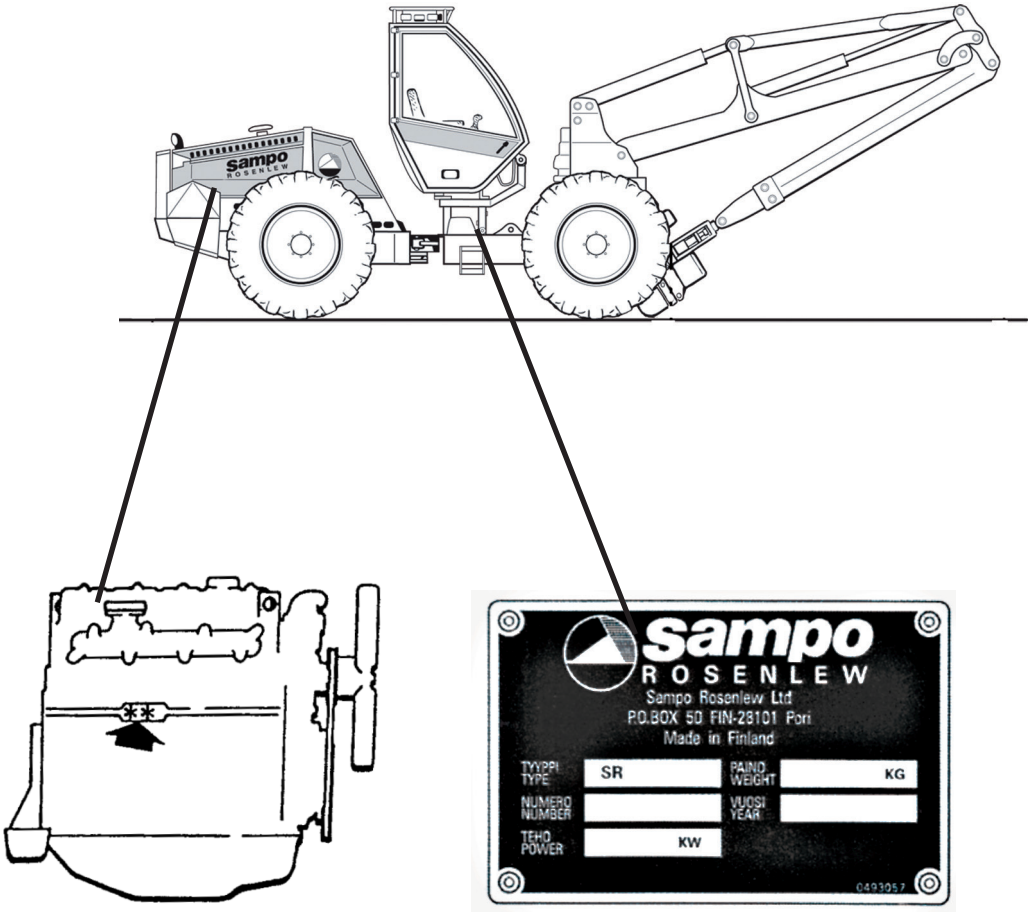
Danger	To avoid danger	Symbol
Subject to danger due to insufficient information	Read the manual before starting the harvester	
A raised part may fall down	Support raised parts before going under them	
Gap in belt drive	Stop the engine and remove the ignition key before removing any guards	
Getting entangled in moving parts	Keep at a safe distance from jointed components	
Falling of the machine or of objects handled with it	Keep at a safe distance from the harvester, the crane, the head and the wood handled	
Electric shock	Keep at a safe distance from power lines. See the safety distances above	

Danger	To avoid danger	Symbol
Fire	In case of fire: - turn off the engine - turn off the main power - extinguish the fire - get help if necessary	
Fire	Extinguish the fire with the fire extinguisher stored under the guard marked with this sticker.	
Service measures	Before starting of service: - turn off the engine - turn off the main power - when servicing the harvester head, remove pressure from the pressure accumulator as instructed	
Safety belt not worn	Always wear a properly adjusted safety belt while working and driving on the road	
Normal exit not available	Open the handle on the right-hand door and exit through the open door. Before starting work make sure that emergency exit is unlocked also from the outside.	
Refrigerant	Leaking refrigerant may cause frostbite	
		

Type marking

When ordering spare parts or service, always quote the type marking and number shown on the machine plate. When ordering engine parts, also quote the engine number.

Write down the serial numbers of the harvester head and the engine on this page (and in the spare parts catalogue).



Fill in the serial numbers of the crane and the harvester head

Engine number

Note! Left side of the forest harvester = The side of the cab with the stairs
Right side of the forest harvester = The side with the side instrument panel

Technical specifications

The base forest harvester with articulated steering includes: the cab, gear box, crane valves, and crane on the front frame, the engine, pumps and tanks on the rear frame.

	SR1066
Weight	Working weight. 14,000 kg
Maximum permissible weight (ROPS)	16,000 kg
Main Dimensions	
Length without crane	5.9 m
Width	2.6 – 3.0 m
Height in transport position	3.5 m with cab tilt
	3.15 – 3.6 m with a fixed cab
Ground clearance	0.6 m
Outermost turning radius (with 600-mm tyres)	4.72 m
Engine	Agco SisuPower 66 CTA-2V
- power	125 kW//2,200 rpm
- fuel tank	330 l
Transmission	
Traction hydraulics pump	155 l / min & 420 bar
Rear wheels get the oil from the working pump	
Rear wheels with hub motors and speed reduction gear	6,370 cc
Front axle drive motor in the gearbox	90 cc
Three speed ranges forward and backward	1st gear 0-4.5 km/h
	2nd gear 0-7.4 km/h
	3rd gear 0-17 km/h
At the front hydraulically controlled mechanical differential lock	
Tyres	
Front	600/65 – 34 or 700/55 - 34
Rear	600/65 – 34 or 700/55 - 34
Hydraulic system	
Pump in working hydraulics	418 l/min / 2,200 r/min & 250 bar
Load sensing, programmable electric joystick control (IQAN)	
Oil tank	220 l
Electric system	
Voltage	24 V
Battery	2 x 145 Ah
Charging generators	2 x 100 A
Working lights	20
Crane	e.g. Foresteri H1395 / H13105
Operating range	9.5 – 10.5 m
Lift gross	154 kNm
Crane weight	1,900 / 1,980 kg
Harvester head	e.g. Keto 51 – 150, Foresteri 20 – 25 with
	a 2- or 3-hose hydraulic system
Max. delimbing diameter	350 - 550 mm
Weight max	900 kg
Brakes	
At the front hydraulically & mechanically controlled drum brakes and a separate parking brake	
At the rear negative multi-disc brakes	
Cab	Quiet safety cab (FOPS, ROPS, OPS)
Noise level	71 dB (A)
Windows	Lexan Margard polycarbonate
Harvesting computer	Mitron IT or PC, EPEC
	a 4-wire CAN route

Certificate on conformity to the EU directives

CERTIFICATE ON CONFORMITY TO THE EU DIRECTIVES

Manufacturer
Sampo-Rosenlew Ltd
Konepajanranta 2A, P.O.Box 50
28101 Pori Finland

Collector of technical spec:
Jari Karén
Address:
Sampo-Rosenlew Ltd
Konepajanranta 2A, P.O.Box 50
28101 Pori Finland

Description of the machine: Forest harvester SR 1066

- complies with the machinery directives (2006/42//EC) and requirements of the national regulations set into force by that.
- complies with the requirements specified in the following machinery directives:

97/68EEC directive on diesel engine exhaust fumes
89/336/EEC directive on electro-magnetic compatibility

The machinery has been designed in conformity with the following international standards:

SFS-EN-ISO 12100	Safety of machinery. Basic concepts, general principles for design.
SFS-EN 14861	Forest machinery Self propelled machinery - Safety requirements
EN-ISO 14982-1998	Electromagnetic compatibility. Test methods and acceptance criteria.

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SAMPO-ROSENLEW OY SAMPO ROSENLEW Ltd

Jali Prihti

Guarantee

Sampo Rosenlew Ltd, later called the Manufacturer, grants a guarantee regarding defects in the material and workmanship.

1. The guarantee period starts as soon as the harvester has been delivered to the customer.

2. The guarantee does not cover:
• freight and postage costs
• transport damage
• damage due to carelessness, misuse or injury
• damage due to impurities in the hydraulic oil or the use of wrong type of oil
• damage due to non-compliance with the operating instructions
• damage due to neglected periodical maintenance procedures
• damage caused by spare parts not approved of by the Manufacturer
• damage due to the natural wear of parts; parts and materials likely to show natural wear, such as :
  - rubber hoses
  - light bulbs, sensors
  - chain and guide bar
  - tyres
  - belts and chains
  - windscreen wipers
  - fuel, oil, coolant and brake fluids
  - filter cartridges
  - packing and gaskets
  - electric cables
  - injection nozzles
  - windows and guards made of polycarbonate
• damage due to measures taken by the purchaser affecting the quality and structure of the harvester. Increasing of the hydraulic working pressure and pressure limits may cause damage;
• indirect damage, such as
  - loss of output or down time
  - compensation claims submitted by a third party
  - overtime and holiday compensations
• damage to property caused by the equipment
• if there is a change in the ownership of the harvester

3. When working in cold conditions, the guarantee is valid only when the outdoor temperature does not drop below -25oC.

4. Any compensation claims under guarantee shall be submitted to the Manufacturer in a complete form within two weeks of the damage.

5. The guarantee compensation is limited, and the Manufacturer shall only replace the defective component unless otherwise agreed with the customer.

6. The components replaced under guarantee are the property of the Manufacturer, and they shall be returned to the Manufacturer upon request. Otherwise they shall be scrapped.

7. The guarantee on components delivered or repaired during the guarantee period will run out at the same time as the guarantee on the harvester.

Structure and functions of the forest harvester

Structure

The Sampo 1066 forest harvester has been designed to carry out later thinning and partly also final felling.

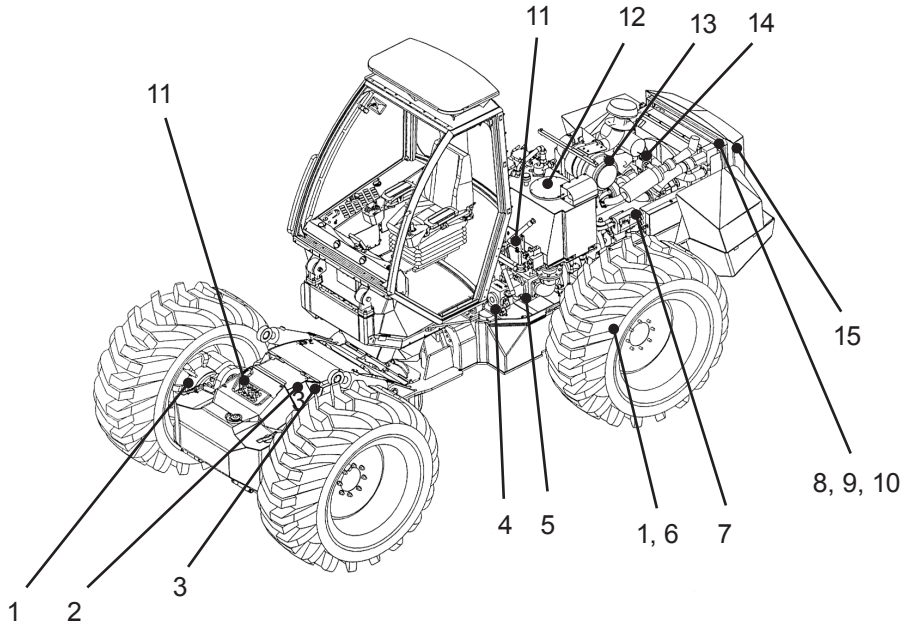
The forest harvester has articulated steering. The crane, gearbox and cab are located on the front frame. The engine, hydraulic pumps and oil and fuel tanks are on the rear frame. The harvester is steered and tilted by means of a joint. The inner rims of both the front and rear tyres go along the same tracks. The harvester is extremely nimble as the turning angle of the frame joint is 50° and the turning radius only 4.7 m. Depending on the tyres, the width varies between 2.5 – 3.0 m. Although the harvester properties have been designed for different types of thinning, it has sufficient capacity for final felling as well.

Harvester head

The harvester head cuts and fells the tree. After that the tree is delimbed and cut into a pre-set length. Due to the large working pump 1,400-1,500 RPM are enough. Too high working revolutions are heavy on petrol. The Sampo harvester is supplied with alternative harvester heads. 3-hose system in hydraulics and the CAN route with its easily detachable connectors used in controlling of the head make it easy to change heads. There are also different harvesting computers to choose from. The basic version is either the EPEC 4W30 or 4W50 (both with cubic volume calculation). When necessary, an on-board computer with a GPS and a data transfer function can be selected.

For further harvesting instructions, consult the harvesting computer and harvesting head manuals.

Cut - away picture of the forest harvester

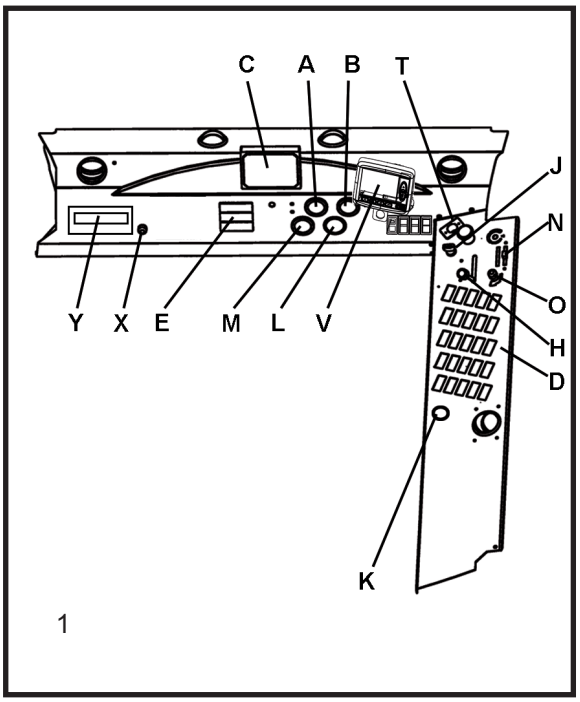


1. Final drive
2. Gearbox
3. Hydraulic motor
4. Traction hydraulics pump
5. Working hydraulics pump
6. Hub motor
7. Fuel tank
8. Radiator
9. Oil cooler
10. Intercooler
11. Hydraulic valve
12. Oil tank
13. Air filter
14. Engine
15. AC condenser

Operator control instruments

Equipment on the instrument panel (fig. 1)

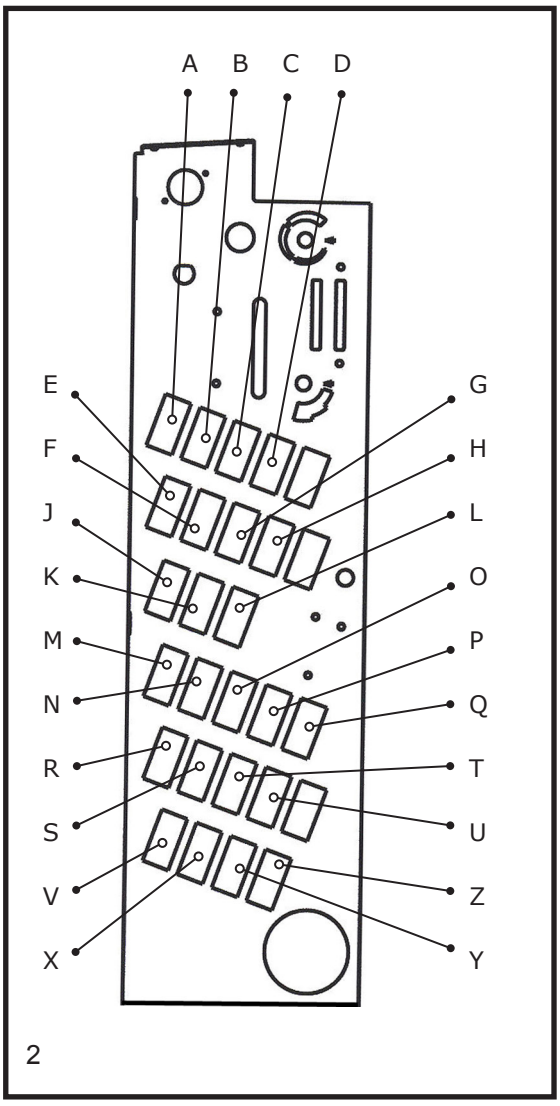
A Engine thermometer
B Thermometer for hydraulic oil
C Harvesting computer display
D Programming wheel of the harvesting computer
E Signal lights
H Throttle lever
J Ignition, starter (and electric stop)
K Emergency stop
L Hour gauge
M Fuel gauge
N Heater thermostat
O Fan speed regulator
T Phone outlet
V IQAN system display
X AC regulator
Y Engine heater display



1

Switches on the instrument panel (fig. 2)

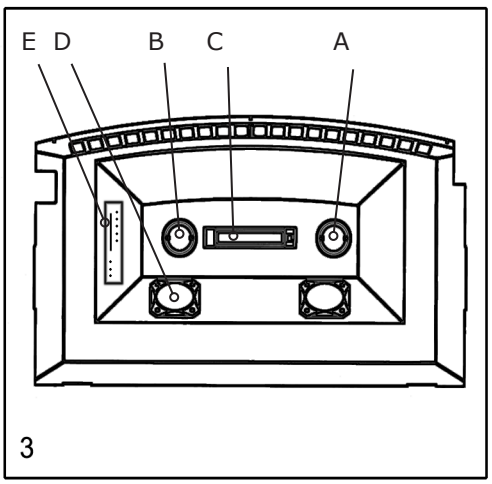
A Alarm reset
B Frame lock
C Working brakes
D Parking brake
E Sound signal
F Windscreen wiper
G Windscreen washer
H Glow signal light
J Harvesting computer
K Headlights
L Seat heating
M Working lights, general
N Working lights, additional
O Working lights, doors
P Emergency flasher
Q Engine diagnosis switch & alert light
R 4WD
S Differential lock
T Dip switch
U Turning signal
V Cab tilting automation
X Cab manual drive forward/backward
Y Cab manual drive left/right
Z Master switch



2

Equipment on the ceiling (fig. 3)

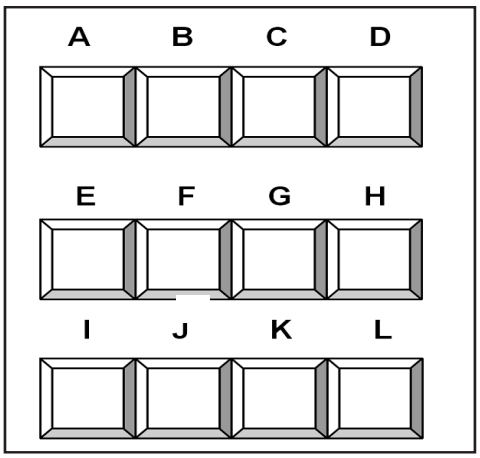
A) Alarm light (yellow)
B) Fire extinguishing system light (red)
C) Indoor light
D) Speaker
E) Radio



Signal lights (fig. 4)

The harvester has signal lights to indicate:

A) lowering of engine oil pressure
B and C) lowering of charge
D) turning signal on
E) overheating of hydraulic oil
F) overheating of engine
G) blocked air filter in engine
H) high beam on
I) blocked suction / return filter in hydraulic oil
K) blocked return filter in hydraulic oil
L) level of hydraulic oil



When the signal light comes on, it indicates the location of the operation or malfunction.

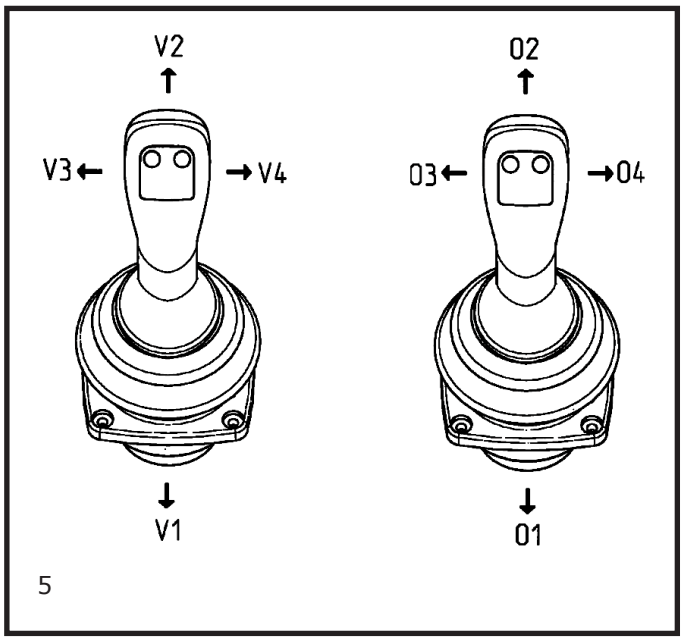
Vertical levers (fig. 5)

Crane control lever, left

V1 Outer boom inwards
V2 Outer boom outwards
V3 Crane turn left
V4 Crane turn right

Crane control lever, right

O1 Crane lift up
O2 Crane lowering down
O3 Frame steering left / rotator turn
O4 Frame steering right / rotator turn



5

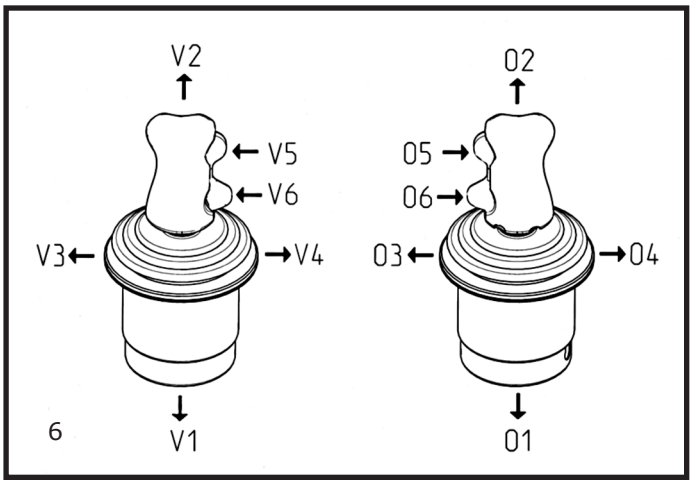
Mini levers (fig.6)

Crane control lever, left

V1 Outer boom inwards
V2 Outer boom outwards
V3 Crane turn left
V4 Crane turn right
V5 Crane extension in
V6 Crane extension out

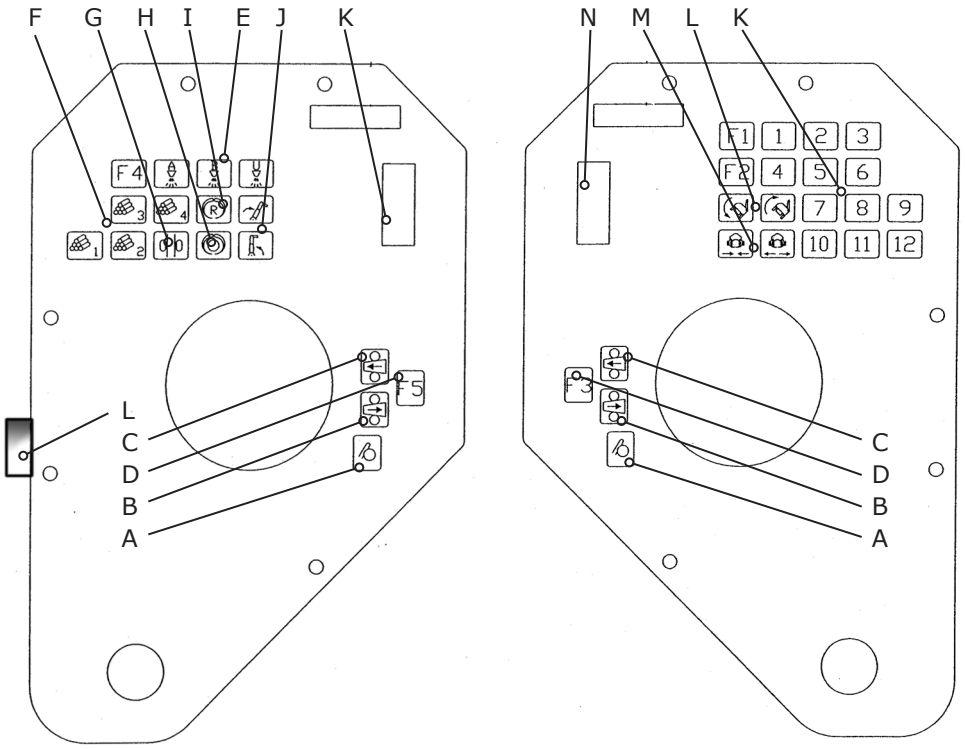
Crane control lever, right

O1 Crane lift up
O2 Crane lowering down
O3 Frame steering left / rotator turn
O4 Frame steering right / rotator turn
O5 Head open / up
O6 Head closed / down



6

Switches on the push button boards on mini joysticks (fig. 7)



7

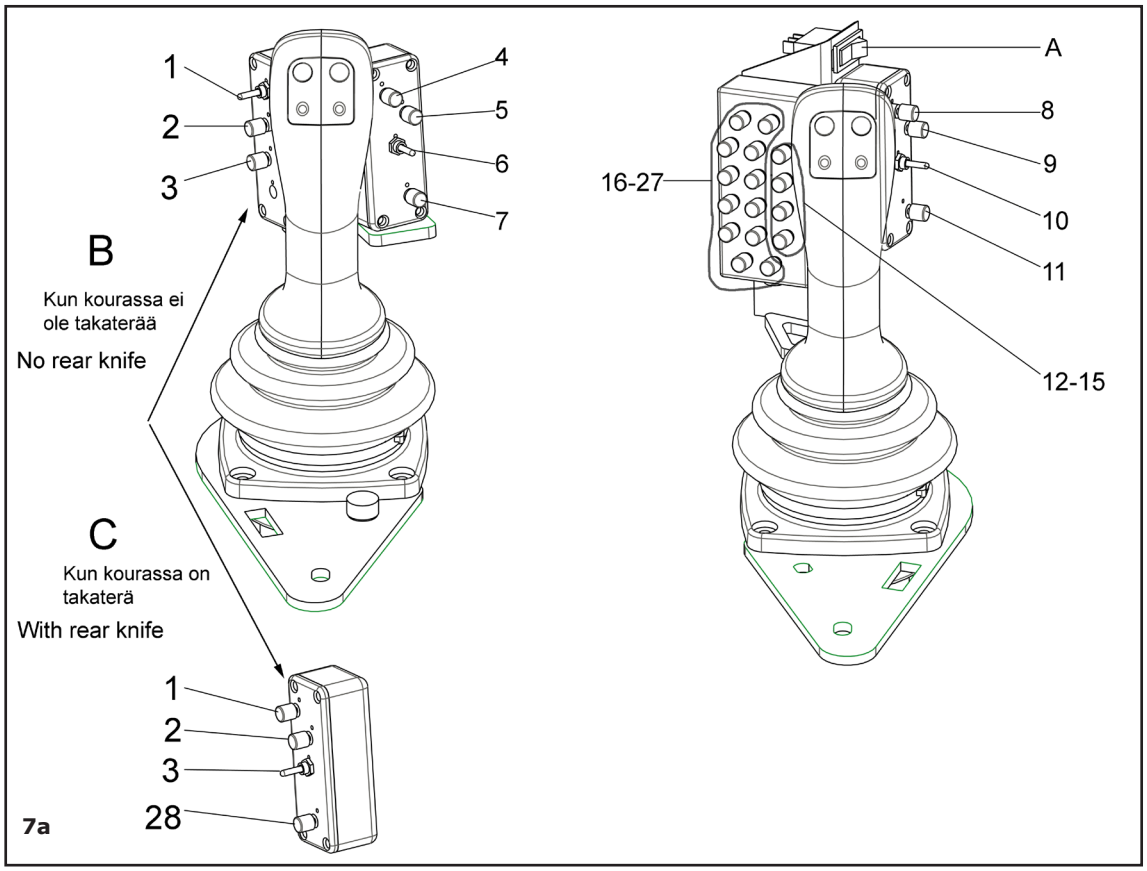
Left-side push button board

A Saw
B Feed forward
C Feed backward
D Vacant
E Colour marking and stump treatment
F Tree species
G Opening of tracks
H Opening of knives
I Opening of rear knife
J Crane tilt forward/backward
K Selection of driving direction
F4 Driving backwards (when button depressed)

Right-side push button board

A Saw
B Feed forward
C Feed backward
D Vacant
K Pre-set measurements
L Harvester head up / down
M Harvester head open / closed
N Harvesting/driving switch

Joystick switches on vertical levers with Motomit harvesting computer (fig. 7a)



Vertical lever switches when the harvester head does not have a rear knife B.

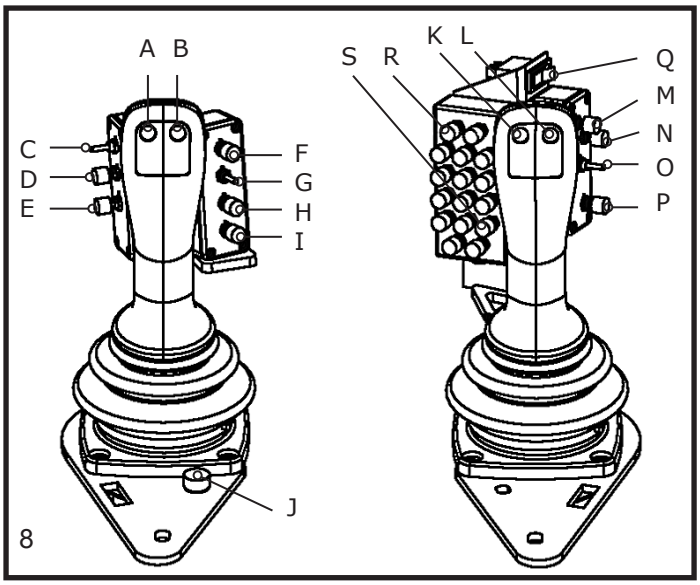
1 Tilt up / down
2 Knives open
3 Tracks / rolls open
4 Slow feed forward
5 Slow feed backward
6 Driving direction
7 Programmable (urea)
8 Fast feed forward
9 Fast feed backward
10 Head open / closed
11 Saw
12-15 Programmable (tree species 1-4)
16-27 Programmable (preset)
A Drive / harvest switch

Vertical lever switches when the harvester head has a rear knife C.

1 Knives open
2 Tracks / rolls open
3 Tilt up / down
28 Rear knives open

Functions displayed on this list are usually programmed in the programmable switches. However, it is possible to tailor the programming for each customer.

Joystick switches on vertical levers with Epec harvesting computer (fig. 8)



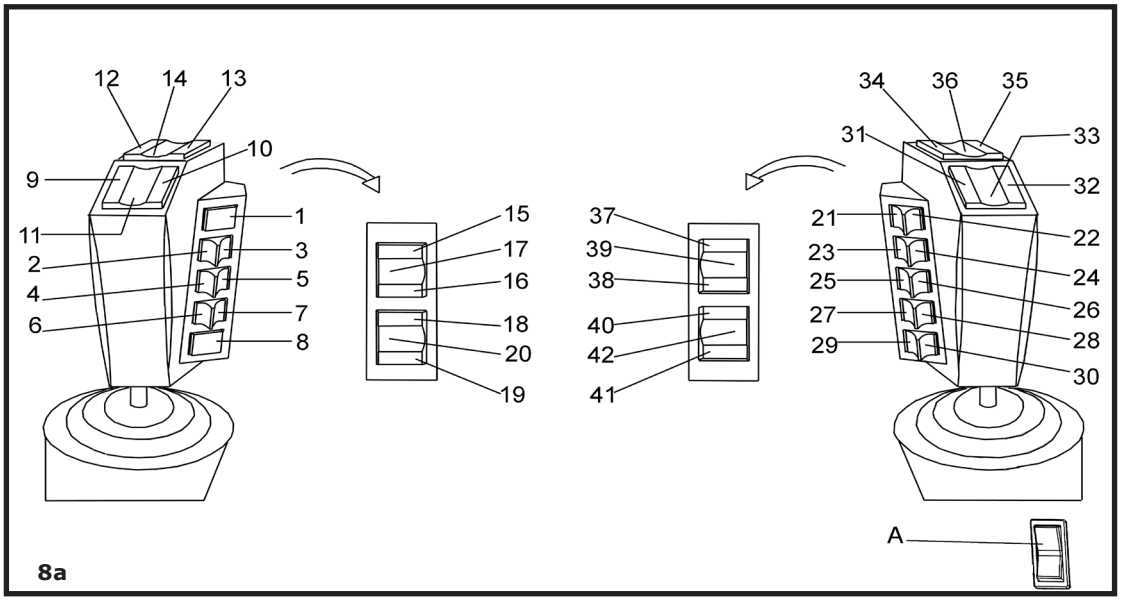
Left-side joystick

A Extension out
B Extension in
C Harvester head up / down
D Opening of knives
E Opening of tracks or rolls
F Saw
G Driving direction (forward in the mid position)
H One wipe of the windscreen
I Stump treatment
J Driving speed adjustment

Right-side joystick

K Crane tilt table forward
L Crane tilt table backward
M Feed forward
N Feed backward
O Harvester head open / closed
P Rear knife
Q Harvest / drive switch
R Pre-set measurements
S Tree species

Joysticks switches on the EME levers (fig. 8a)



8a

Left-side joystick

1 Saw
2 Programmable (tree species 1)
3 Programmable (tree species 2)
4 Programmable (tree species 3)
5 Programmable (tree species 4)
6 Driving direction backwards
7 Driving direction forward
8 Single wipe
9 Feed backward
10 Feed forward
11 Vacant
12 Slow feed backward
13 Slow feed forward
14 Vacant
15 Tilt up
16 Tilt down
17 Vacant
18 Crane extension in
19 Crane extension out
20 Vacant

Right-side joystick

21 Programmable (quality 1)
22 Programmable (quality 2)
26 Programmable (quality 3)
24 Programmable (quality 4)
25 Programmable (quality 5)
26 Programmable (quality 6)
27 Programmable (color test)
28 Programmable (shift)
29 Programmable (new frame)
30 Programmable (reset)
31 Head open
32 Head closed
33 Vacant
34 Knives open
35 Tracks / rolls open
36 Rear knife open
37 Programmable (up)
38 Programmable (down)
39 Programmable (cross-cutting length)
40 Boom front tilt back
41 Boom front tilt front
42 Vacant
A Drive / harvest switch

Signs and symbols

Glow

Suction filter

Return filter

Hydraulic oil temp.

Seat heating

Ignition lock

Oil pressure

Engine revolutions

Sound signal

Working light

Phone

Fan

Rotating flasher

Heat alarm for coolant

Headlight, full

Brake

Differential lock, front

4WD

Headlights

Engine diagnosis light (orange symbol)

Master switch (electric)

Hour gauge

Pressure filter

Hydraulic oil level

Fuel

Windscreen washer

Diesel engine stop

Charge

Gear diagram

Turning signal

Windscreen wiper

Parking light

Air conditioning

Emergency flasher (red symbol)

Headlights, dipped

Indoor light

Joint lock

Air filter

Harvesting computer

Emergency exit

Operation and Adjustments

The harvester functions have been divided into two different functioning environments: harvesting in forest and longer-range driving. The difference between these operating environments is in automation. With the harvesting / driving switch (keyboard or on instrument panel (EME)) in the harvesting position, the harvester head can always be rotated using the right-side joystick with the drive pedal in its mid position. When depressing the drive pedal, the right-side joystick starts to steer the frame thus enabling a quick and efficient change from harvesting to driving towards the next tree.

Both the brakes and the frame lock can be made to function automatically depending on the drive pedal position. When depressing the frame lock switch (fig 2, switch B) and the working brake switch (fig 2, switch C) in their forward position, the working brakes and the frame lock get always engaged when the drive pedal is in its mid position. Correspondingly when depressing the drive pedal, the working brakes and the frame lock get disengaged. This keeps the harvester stationary and stable during harvesting, but allows nimble moving towards the next tree.

Doorswitch

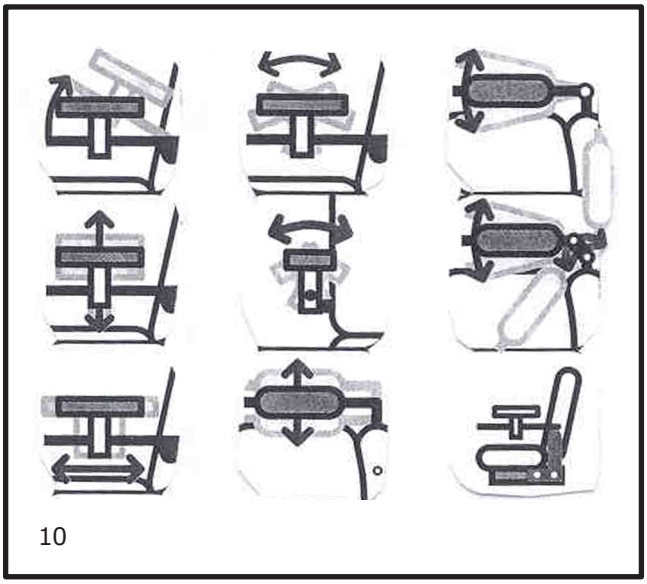
When the left side door is open, the crane movements, frame steering, drive and head movements are switched off. **Note,** in this case steering does not work and some models of harvesting heads may move back to the resting position, in other words close.
After disconnection by the door switch harvester head is reset back to functional status as follows:

· Press ENTER from the Harvesting computer
· Select the service menu, and then press ENTER
· Click Reset, and then press ENTER
· Select the switch on harvester head current menu and then press ENTER
· Close the head, and then press ENTER
· Press the ESC button twice

The printer of the harvesting computer has its own power switch. Turn it on when you want to print. When printing, the printer must be horizontally positioned.

Joystick positions can be adjusted (fig. 10)

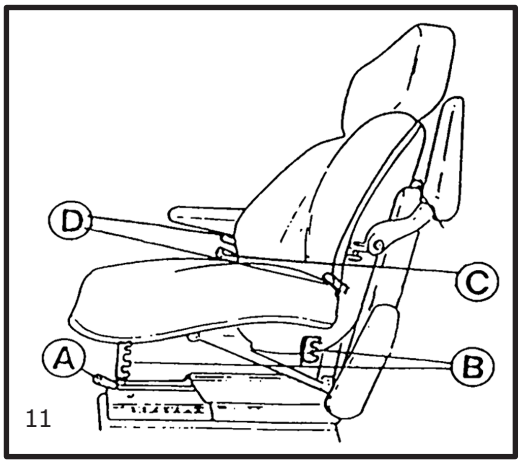
The positions of the crane joysticks and seat armrests can be adjusted at several points. To facilitate entering and leaving the cab, the joystick near the door can be turned both up/down and sideways. After adjustment it is important to lock the positions of the joystick and the armrest to prevent unwanted movements.



10

Seat has several adjustments (fig. 11)

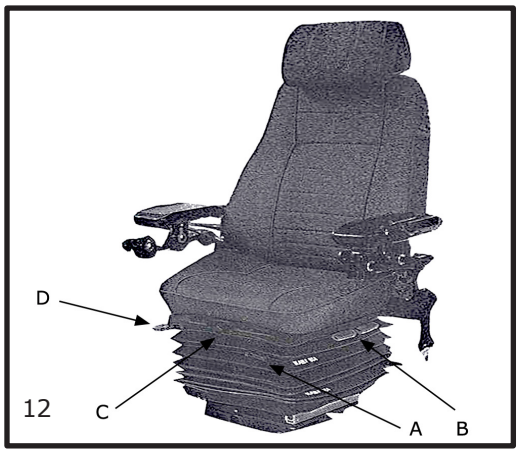
1. To adjust the fore and aft position of the seat, lift lever A and move the seat in the required direction.
2. Adjust the height using forks B at the front and back of the seat.
3. Adjust the suspension using lever C.
4. Adjust the backrest angle using lever D.



11

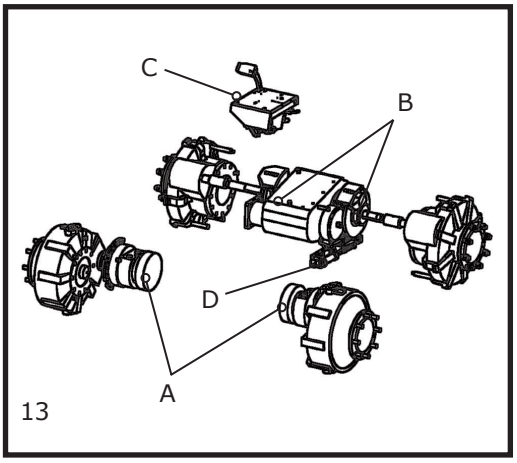
Air suspended seat has more adjustments (fig. 12)

1. To adjust the fore and aft position, unlock lever A and move the seat in the required direction.
2. Adjust the height and fore/aft tilt by pressing levers B on the side of the seat and lifting/depressing the front or rear of the seat.
3. Adjust the seat suspension pneumatically by pressing button C.
4. Adjust the backrest angle using lever D.



12

Brakes while driving and harvesting (fig. 13)



13

The rear wheels of the harvester have negative hydraulic multi-disc brakes A. Braking power is generated by springs, and the brakes are released hydraulically.

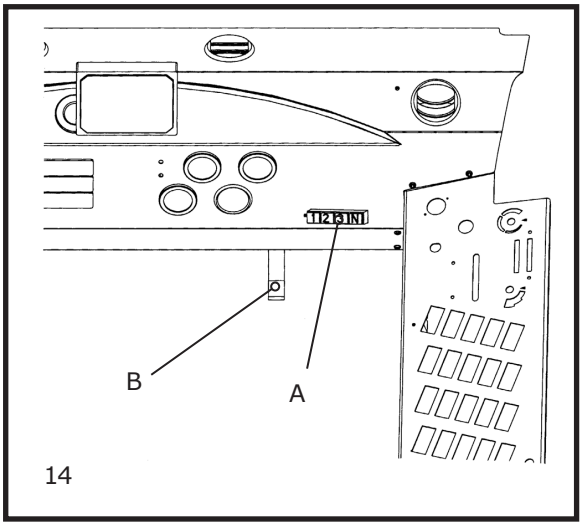
The front axle has disc brakes B, which operate on the front wheels through the drive shafts. Disc brakes can be used both hydraulically and by means of the brake pedal.
With the gear engaged, hydrostatic drive transmission automatically brakes when the drive pedal goes toward its mid position.

A triple-position switch in the cab (fig 2, switch C) mainly controls the brakes. It controls the working brakes both at the front and rear. Using the switch the brakes can be engaged, disengaged and shifted to their automatic position hydraulically. In their mid position the brakes are always engaged, and when depressed all the way back they are always disengaged. In their forward position, that is the automatic position, the brakes operate depending on the position of the drive pedal.
In normal harvesting or when driving on hilly roads, the brake switch should be in its automatic position.

In the cab there is also brake pedal C, which can be depressed to generate braking power on the brake discs comparable to pedal power. When slight braking power is generated at the front either by the brake pedal or hydraulically, the rear brakes get engaged. Therefore depressing the brake pedal generates the same braking power as hydraulic braking.
For safety reasons both the front and the rear working brakes get engaged if the engine stops unintentionally, e.g. due to overload. This happens even with the brakes in their off position. The spring-loaded brakes at the rear become engaged automatically as there is no driving power to engage the brakes. The pressure in the hydraulic accumulator keeps the front brakes engaged, if the engine stops unintentionally. The front working brakes do not remain engaged if the engine is switched off using the ignition key. The reason for this is to prevent the harvester from rolling downhill in case the hydraulic accumulator becomes discharged during long-term parking. If this were not the case, the harvester could be parked on such steep ground that even the front working brake were needed to keep the harvester stationary. With the hydraulic accumulator becoming discharged in the long term, the braking power of the front working brake decreases, and the harvester can roll downhill.

Parking brake (fig 14)

Parking brake D is operated using a dual-position switch (fig 2, switch C). The parking brake engages the spring-loaded handbrake in the front axle gearbox and the spring-loaded working brakes at the rear. The harvester cannot be driven with the parking brake on. This prevents the parking brake from being engaged unintentionally. The parking brake gets engaged automatically when the engine stops or is switched off. At the same time the rear working brakes get engaged to function as a parking brake. Switching off of the engine disengages the front working brakes.



14

Frame lock

The frame lock operates similarly to the working brakes. Depending on the position of the frame lock switch, the dual-function cylinders lock the frames together, allow them to rotate independently of each other, or operate in an automatic position in the same manner as the brakes. With the frame lock switch (fig 14, switch A) in its mid position, the frame lock is always engaged, and when depressed backward, the frame lock is disengaged. Normally when harvesting, the frame lock switch should be in its automatic position, i.e. in its front position.

Traction transmission

Engine power is transmitted to the consecutive work and drive pumps by means of a torsional coupling. From the pump to the hydraulic motor of the gearbox on the front axle power is transmitted by means of closed loop hydraulics. From the gearbox power is transmitted to the front wheels by means of drive shafts and final drives.

The gearbox has three speed ranges (1, 2, 3) and neutral (N). The gear is selected using push buttons A (fig. 14). 1st gear (button 1) is intended for harvesting, 2nd gear (button 2) for driving in the forest and 3rd gear (button 3) for driving on the road. Gears should be shifted on level ground with drive pedal B in its up position. When shifting gear, the harvester must be stationary and the working brakes engaged using switch C, fig. 2.The parking brake should be disengaged. When these conditions are met, the gear is changed first into neutral and then into the selected gear. The IQAN display will say: "Gear in neutral! Select gear" for as long as the gear is in neutral. This is to inform the driver in case the selected gear does not get engaged immediately. As soon as the selected gear is engaged, the message on the IQAN display will disappear, and the symbol light of the selected gear will come on next to the gear selection buttons. For safety reasons, with no gear engaged, all the brakes get engaged automatically, i.e. the front working and parking brakes and the rear working brake. At the same time the rear motor hydraulic lines get closed even with only the front-wheel drive on. This provides the rear with hydraulic braking power whenever the gear is not engaged.

The harvester is driven using drive pedal B. The harvester starts moving when the drive pedal is pressed, and accelerates speed when the pedal is pressed more. Fault diagnostics monitors the drive pedal condition constantly. If a pedal defect is detected, the IQAN display will say: "Drive pedal do not work properly. Do you want to drive to service?" A YES answer, i.e. pressing of F1 on the display, will make the harvester move at a low speed and the display will say: "Limb mode" Now driving speed and crane movements are very slow. A NO answer, i.e. pressing of F2, will show "Drive pedal not functioning properly" on the display. However, this does not prevent working. Ensure you are aware of any risk caused by the defect and find out the reason for it.

A separate switch is used to select the driving direction. On models with vertical levers this switch is on the left-side joystick (fig. 8, switch J). On models with mini levers this switch is on the left-side push button board (fig. 7, switch K). On models with EME levers the driving direction selector is on the left-side joystick (fig. 9, switch 15-16). When driving in traffic, the harvester head should be kept close to the harvester and tied up. The harvesting computer should be switched off in case of unintended crane movements.

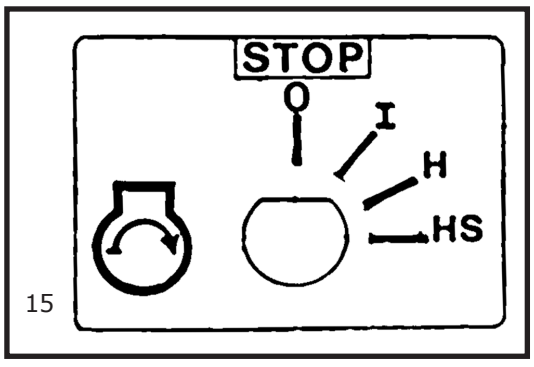
A forest harvester equipped with hydrostatic transmission must never be parked using only the gear, but the parking brake that is engaged automatically when power is switched off must be used. Hydraulic motors alone cannot keep the harvester stationary for a long period.

Four-wheel drive

The rear wheels have hydraulic hub motors connected to reduction gears. Oil to them comes from the working hydraulics pump through the valves on the front wall of the oil tank. The angle sensor on the middle joint is used in valve control.
4WD is switched on electrically using switch V on the right-side instrument panel, (fig. 2). The coupling shall be done with the harvester stationary. 4WD can only be used in 1st gear. Front-wheel drive is always on with the gear engaged.
For safety reasons the rear hydraulic lines get closed if the engine stops unintentionally, e.g. due to overload. This will happen even with the 4WD switched off. This provides the rear with hydraulic braking power although there is no traction power.
When towing the harvester, four-wheel drive must be off and the engine running to allow the wheel motors to be disengaged. Short-distance towing at a low speed is permitted if the engine and the drive pump cannot be kept running. In such a case the brakes should be released mechanically.

Starting of the engine (fig. 15)

The engine is started with the ignition key. Turn the key to the right to switch on the ignition and turn on the alternator and oil pressure lights. When turning the ignition key farther to the right, to position HS, the engine starts. Position I can also turn on the glow signal light to indicate that the pre/post heater (the glow) is working to facilitate cold starting of the engine. The length of the glow operating time depends on the outdoor temperature.
With the throttle (fig. 1, part H) in its rear position, the engine runs at full revolutions.
The harvester is equipped with a highly safe starting system that checks the brake functions and prevents the harvester from moving when the engine is started. It allows starting only with the drive pedal not pressed and the brakes on. During starting crane and cab movements as well as driving are prevented. If the drive pedal is pressed or the brakes are not on with the ignition key in its HS (starting) position, the text "When starting, brakes have to be on and drive pedal not pushed" will be displayed on the IQAN. When the conditions are met, the engine will start. With the brakes engaged as required, the brake pressure switch must switch itself on. If this is not the case, the IQAN will display "Front brakes are not on or do not work Do you want to drive to service in limb mode?" A YES answer, i.e. pressing of F1 on the display, will make the harvester move at a low speed and the display will say: "Limb mode". Now driving speed and crane movements are very slow. A NO answer, i.e. pressing of F2, will show "Front brakes do not work" on the display. Now crane and cab movements are prevented, and the harvester cannot be driven until the power has been switched off and the testing procedure restarted.



15

Differential lock

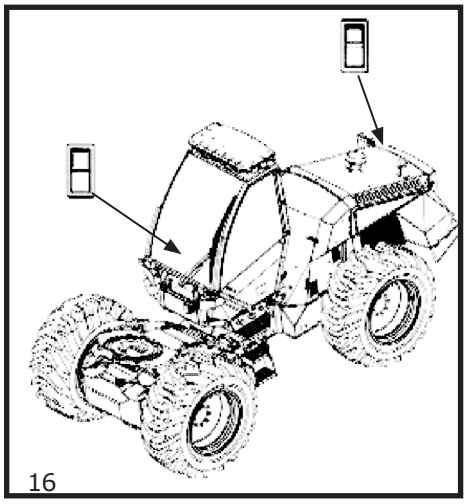
There are sometimes situations when one of the front wheels does not have sufficient grip in respect to the required traction power. This can be avoided by engaging the differential lock inside the gearbox using switch X (fig. 2). The lock at the front is 100% mechanical. On solid ground the lock prevents turning, so then it shall be switched off. With 4WD engaged, the rear wheels always have a hydraulic (not 100%) lock on.

Stopping of the engine

Before switching off the engine, move the throttle into the idling position. The engine is switched off using the electric stopper by turning the ignition key to position 0. Beware of the movements of the harvester head when you switch off the diesel engine. When the power is switched off, the harvester head controls switch off as well and the head may return to its resting position from certain functions. These kinds of functions include, for example, Head closed and Tilt down, depending on the type of the head. The harvester heads often also contain pressurized batteries, potentially causing there to be enough power left for head movements even after the power has been switched off. When finishing working it is recommended to turn off harvesting computer and PC. In this case there is no danger that even accidental use of harvesting head would cause unwanted movements in restarting.

Electric master switch

There is a master switch to control the electrical instruments of the harvester. The electric current to the whole harvester can be switched off using switch Z, fig 2. The right-hand side additional fuel tank has a similar switch (fig. 16). Make it a habit to switch off the main power when leaving the harvester.

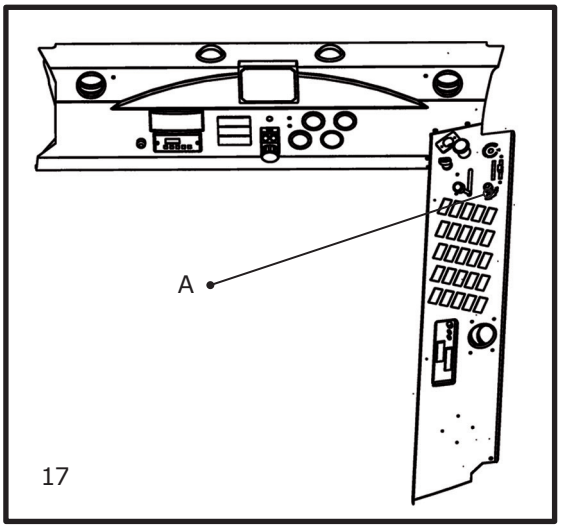

16

Emergency stop

When the emergency stop switch (fig. 1, switch K) is depressed all the way, the diesel engine gets switched off, but there is still current in the electrical system. This engages all the brakes, i.e. the rear brake and the working and parking brakes at the front. Remember that when the engine is switched off, the harvester cannot be steered, and the braking power of the front working brake decreases little by little. Parking brakes will of course stay on until the harvester is re-started.

Cab fresh-air fan provides good ventilation.

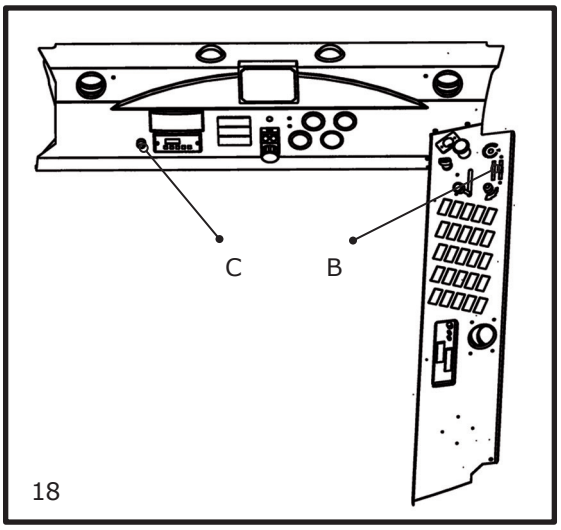
The 3-speed fan is started using switch A (fig. 17). To change the airflow direction, turn the nozzles on the panels. The fan air is sucked in from the rear bottom corner of the cab through filters. The outer-most filter is of a coarse mesh type, and the inner one is the actual fresh air filter.
To keep up the fan capacity and secure the purity of the air, the filters shall be cleaned or replaced often enough to prevent impurities and fungi from clogging them. In dusty conditions it is necessary to clean the coarse mesh filter several times a day.



17

Heater provides additional heat from the engine

The air in the cab is heated by a heating element in which the engine coolant circulates. Push lever B forward to increase the amount of coolant circulating in the element. This will increase the temperature in the cab.



18

Air conditioner (fig. 18)

Air conditioner cools the air in the cab. The cab is equipped with an air conditioning system.

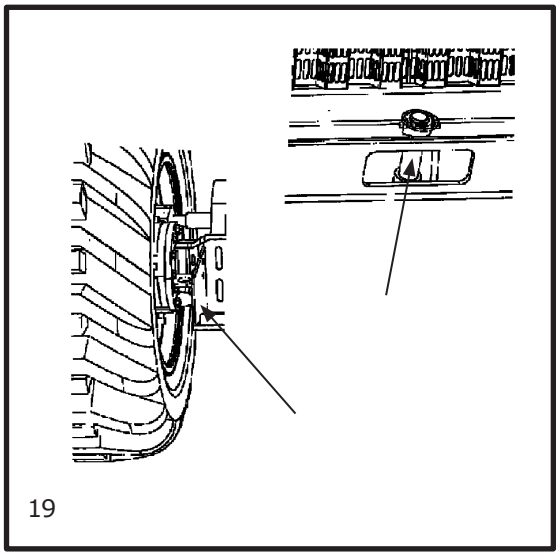
Turn switch C (fig. 18) to the right to switch on and regulate the air conditioner. Note! A difference of over 8°C between indoor and outdoor temperature is harmful to your health. Keep the cab door closed when the air-conditioning is on. Keep the heater regulator lever in its cold position, i.e. the water circulation off.

The alarm light on the ceiling flashes and there is a sound on the instrument panel if the engine oil or hydraulic oil temperature increases too much. Hydraulic oil temperature is monitored in the oil tank and in the closed loop drive hydraulic motor housing. The alarm light also flashes if the oil pressure decreases or the hydraulic oil filter becomes clogged. The flashing light can be reset, but a small signal light will stay on. The light will also flash when power is switched on to check the signal light function. When the alarm light starts flashing, find out the reason for it immediately and carry out any necessary repairs.

Towing (fig. 19)

Towing is allowed from towing points only. The harvester may be towed from designated points only. When towing backward, the towline is put around the pin as shown in fig. 19. When towing forward, there are holes as shown in fig. 19 near the reduction gear. With the harvester on tow, the operator must be in the cab and the engine running to enable steering. Four-wheel drive must be off.

Unless the engine can be started, the harvester must be towed with great care, as steering is not working. In this case, the brakes should also be released mechanically
When towing on the road, statutory traffic regulations must be followed.

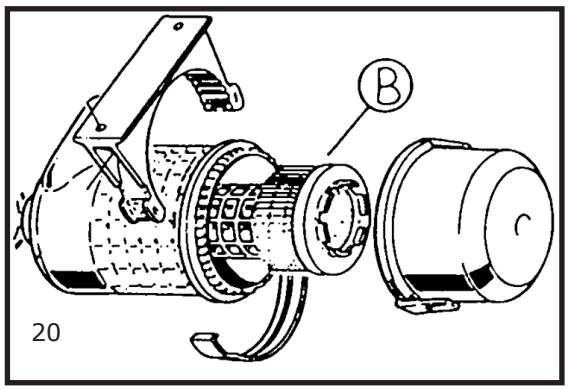

19

Engine, source of power

The engine is a water-cooled, four-stroke, Common Rail diesel. For a more detailed description of the engine, see the engine manual.
Power is transmitted from the rear of the engine to the working hydraulics and traction transmission pumps. The front of the engine houses belt drives for the fan and the alternator generators and the AC compressor.

Suction air filter (fig. 20)

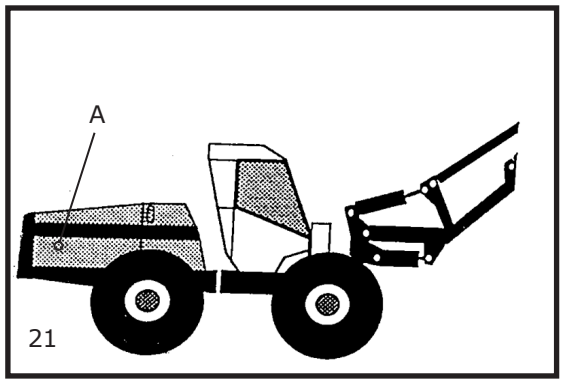
The engine suction air is cleaned by prefilter and two-part paper filter B. If the filter is clogged, signal light G (fig. 4) will come on on the front instrument panel. Clean or replace the filter. See cleaning instructions under service and maintenance.
The prefilter is inside the filter cartridge and it is continually drained by means of an exhaust fume ejector.



20

Fill the tank with fuel free from impurities (fig. 21)

The volume of the fuel tank is 330 litres. Use high-quality diesel oil as fuel. Check the fuel requirements in the engine manual. The fuel must be free from any impurities and water. Before refuelling, remove all impurities from around filler A. Never drain a spare tank into the fuel tank, as impurities and water tend to settle on the bottom. If fuel is added from a spare tank, a funnel with a sieve must be used.

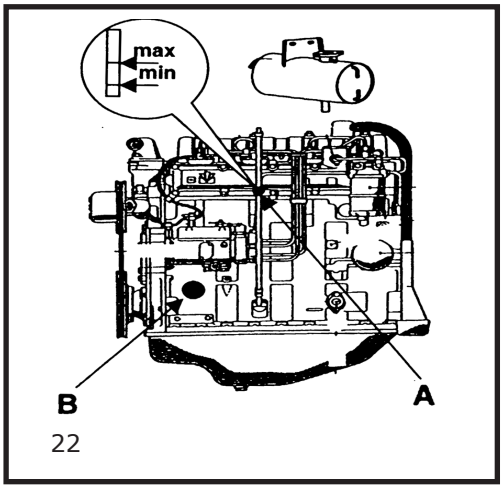


21

There are air bleeds on the outer rim of the filler through which air gets into the tank. Make sure these bleeds stay unblocked. Never use a filler without air bleeds.

DAILY CHECKS OF THE ENGINE

Lubrication system (fig. 22)



22

It is of utmost importance to use correct lubricating oil, in accordance with the load placed on the engine. See Lubrication Table under Maintenance. Check the oil level daily before starting; it shall be between the minimum and maximum marks on dipstick A, preferably near the maximum (fig. 22). Oil is refilled through filler B. A warning light on the instrument panel indicates low oil pressure. Should the oil pressure warning light come on with the engine running, stop the engine immediately and find the cause for the trouble.

Cooling system

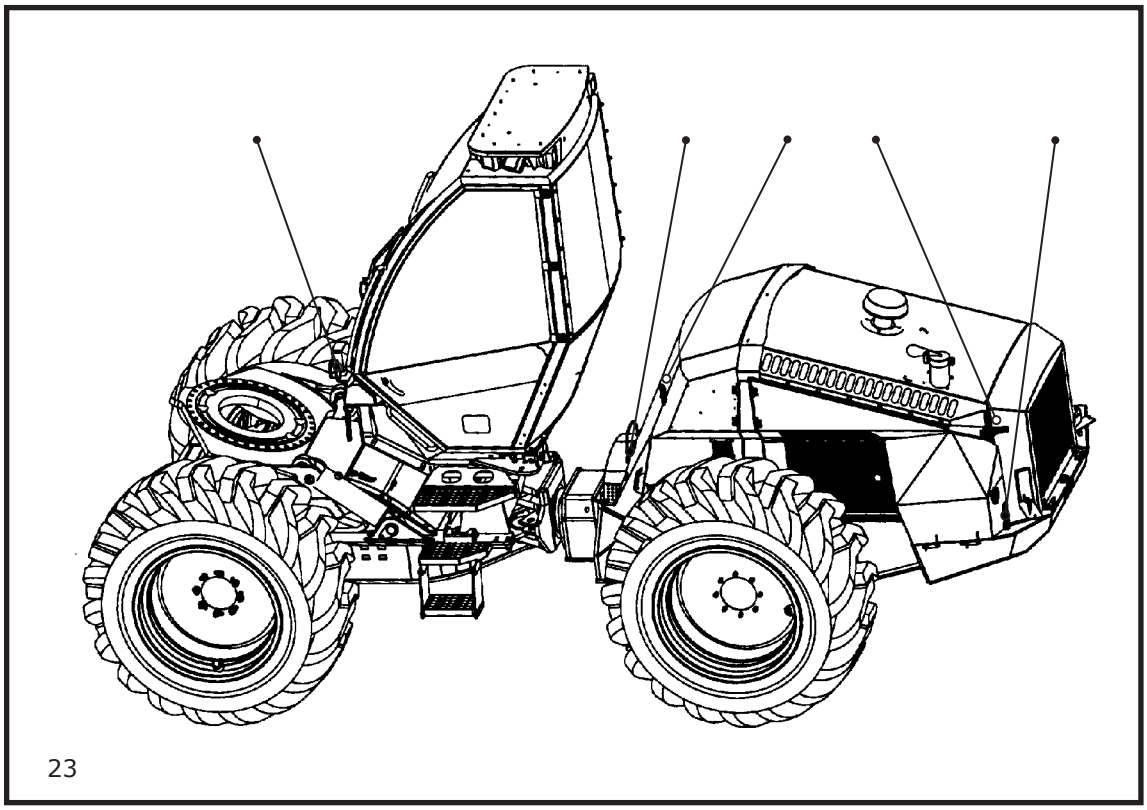
The engine cooling system is filled with coolant that has 40-50 % ethylene glycol in it. Do not use plain water as coolant as it damages the engine. Before refill, the engine must be cooled off. When refilling, remember the coolant expands considerably when it gets warm, so do not fill up the system. The coolant level is correct when the cells are clearly covered by the coolant, and the coolant level can be seen at the bottom of the level indicator hose on the expansion tank. Check the coolant level daily before starting.
The coolant temperature can be seen in the gauge on the instrument panel. It shall be between 75-95°C. A warning light on the instrument panel indicates engine overheating when the temperature reaches 95°C. If the temperature starts to rise, check that the outside of the radiator is not clogged. The best way to clear blockage is to direct compressed air from the side of the fan through the radiator, or use a brush for cleaning. Always be careful not to damage the lamellas. Behind the cooler course mesh filter there is a small-holed screen. To clean it, first turn the rear cog to its down position and then lift up the screen.

Fire extinguishers

The harvester is supplied with two portable 6-kg fire extinguishers. They are located above the rear wheel inside a side guard that opens backwards. The extinguishers shall be checked every six months by an authorised service outlet.
The harvester may also be equipped with a semi-automatic fire extinguishing system, which shall be operated in compliance with the Manufacturer´s instructions.

Opening of the guards

The movable guards of the forest harvester are equipped with quick-release locks. The guards can be locked placing an ordinary padlock in the hole for the quick-release lock.



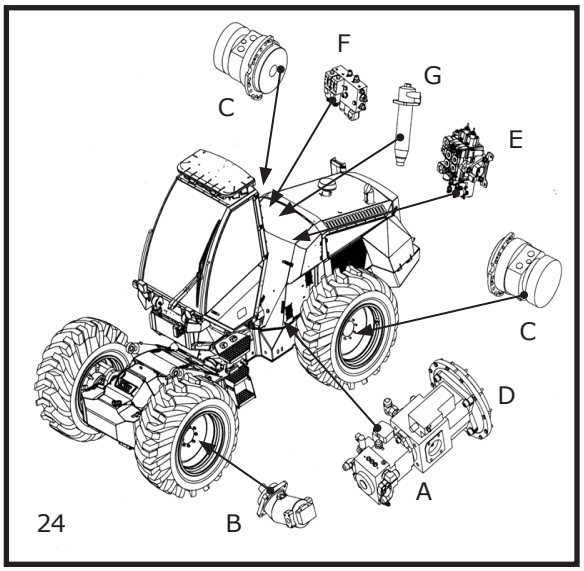
23

Hydraulics

The harvester has both open and closed hydraulic circuits. They have a joint oil tank on the rear frame of the harvester.

The closed hydraulic circuit in front-wheel-drive (fig. 24) has a suction / return filter, a drive pump and a hydraulic motor at the front.

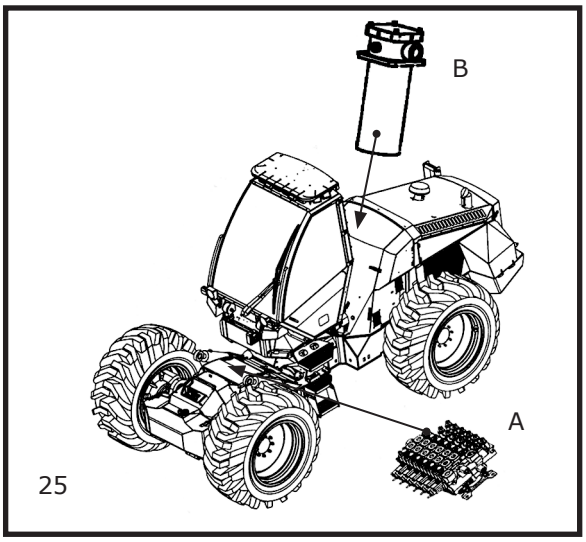
The drive pump produces a pressure corresponding to the tractive resistance and an oil flow corresponding to the drive pedal position.



24

The open hydraulic circuit in rear-wheel drive comprises the same pump as in working hydraulics, a 2-segment mobile directional valve and the rear wheel hub motors. Additionally there are separate pilot valves for the disengagement of 4WD and a pressurization block to prevent cavitation. When using four-wheel drive, the valves direct the right amount of oil to each rear wheel. When using front-wheel drive, the rear motors are disengaged.

A Closed circuit pump
B Hydraulic motor at the front
C Hub motors
D Open-circuit pump
E Rear-wheel drive directional valve
F Cavitation prevention valve
G Suction / return filter



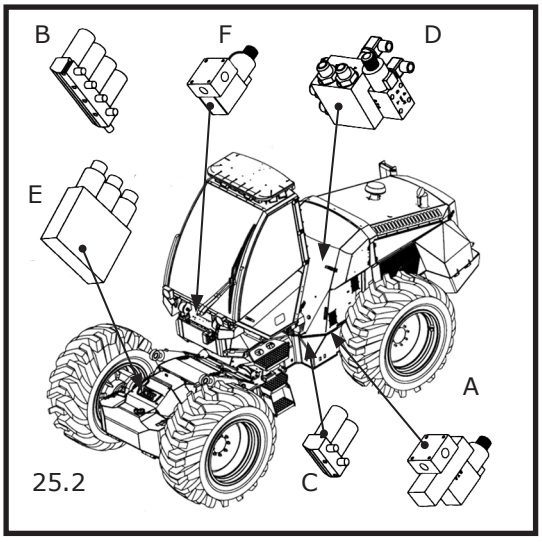
25

Working hydraulics in the base harvester (fig. 25) uses the above-mentioned open-circuit pump, a load-sensing directional valve and a return filter. Crane movements are controlled by a load-sensing valve. The work pump produces the right pressure and output in relation to load weight and speed. This enables fast and precise movements in every circumstance. Magnetic valves in the cavitation prevention block and adjustable pressure limits are used in the pressurization of the harvester head.

A Crane directional valve
B Return filter

It is forbidden to change the pressure settings in working and traction hydraulics without permission from the Manufacturer, as it may damage the harvester and cause risk of injury to the mechanic and the harvester operator.

Directional valves control the functions of the frame lock (A), brakes (F, C), differential lock (B), 4WD disengagement (D), crane turn brake (B) and gear shift (E) (fig. 25.2).
The frame lock is equipped with a dual-function cylinder. The cylinders are cross-connected and linked to the low-pressure cooling oil line. When the frame lock is engaged, the directional valve closes the flow ways and the cylinders become locked in their place.
The gear shifting mechanism takes the working pressure from the working hydraulics pump through a pressure reducer valve. The rest of the operating devices mentioned above take their driving force from the drive pump feed pressure.



25.2

There is a separate hydraulic pump to cool down the hydraulic oil besides the closed circuit feed pump output used for cooling. These oils are directed through a thermostat valve to an oil cooler. From there the cooled oil goes to the suction / return filter from where some oil is sucked by the closed circuit feed pump and some return to the tank. When oil temperature is below 38oC, the oil does not circulate through the cooler.

When dealing with hydraulics, uncompromising cleanliness is of utmost importance. The oils used shall comply with the Manufacturer´s instructions. Refill shall always be done through the return filter.

Electrical instruments

The control of the base harvester is based on the IQAN machine control system. It also conveys what diesel speed is required and provides diesel sensor data. In the control of the harvester head a specially developed harvesting computer is used with different on-board computer applications.

The engine is equipped with an alternator generator.

NOTE! With the engine running, the master switch must not be turned on, and the ignition key must not be turned in the 0 position if there is a separate stop lever in the harvester.

Fuses

Fuse Box 1

1F1 Turning signal left	7.5 A
1F2 Turning signal right	7.5 A
1F3 Parking lights	7.5 A
1F4 Gauge lights	7.5 A
1F5 Headlight left, dipped	7.5 A
1F6 Headlight right, dipped	7.5 A
1F7 Headlight left, full	7.5 A
1F8 Headlight right, full	7.5 A

Fuse Box 2

2F1 Radio, indoor light, EHS	15 A
2F2 Working light relays	7.5 A
2F3 24 plug outlet, emergency flasher	10 A
2F4 Rotating flasher	10 A
2F5 Turning signal	7.5 A
2F6 Windscreen wiper	15 A
2F7 Brakes, frame lock, CTA control	15 A
2F8 Safematic greasing system	15 A

Fuse Box 3

3F1 Fan, AC compressor	25 A
3F2 Sound signal	10 A
3F3 Seat heating, compressor	10 A
3F4 Main relays, measuring device,iqan control	7.5 A
3F5 Gauges, warning lights	7.5 A
3F6 PC	10 A
3F7 Fire extinguishing	10 A
3F8	

Fuse Box 4

4F1 Working lights, crane	25 A
4F2 Working lights, front, down, right and left (add. light)	25 A
4F3 Working lights, cabin roof	25 A
4F4 Working lights, cabin roof	25 A
4F5 Working lights, cabin roof	25 A
4F6 Working lights, cabin roof	25 A
4F7 Working lights, door, right and left	25 A
4F8 Working lights, (additional lights)	25 A

Fuse Box 5

5F1 Main current, K3 + 15	25 A
5F2 Working lights, front, down right and left	25 A
5F3 Main current, K7 + 15	15 A
5F4 Main current, ignition lock + 30	25 A
5F5 Air-conditioning	10 A
5F6 Harvesting computer	10 A
5F7 Cab, X39:1	
5F8 IQAN XP-A0	20 A

Fuse Box 6

6F1 main fuse, IQAN control, fuel pumps and valve	25 A
6F2 IQAN XY2-A1	20 A
6F3 IQAN XP-A1, additional amplifier module	20 A
6F4 Vacuum pump	7.5 A
6F5 Cab, X39:2	
6F7 Hydraulic filler pump solenoid	15 A
6F8 Cab, X39:3	

Fuse Box 7

7F1 Plug, cab front	10
7F2 PC pre-heating	5 A
7F3 Fuse	
7F4 Fuse	
7F5 Fuse	
7F6 Fuse	
7F7 Fuse	
7F8 Harvesting computer + 30 Dasa	10 A

Fuse Box 8

8F1 Fire extinguishing	10 A
8F2 Fuse IQAN MD3	3 A
8F3 Engine comp. service light	5 A
8F3 Engine heater add. water pump	10 A
8F5 Fuel filler pump plug	20 A
8F6 Engine heater fan	15 A
8F7 Engine heater	15 A
8F8 Engine heater timer	5 A

Fuse Box 9

9F2 hydraulic motor sensor rpm	1 A
9F3 CTA ignition key +15	5A
9F4 fuel transfer pump	10A
9F6	
9F8 fuel sensor	2A

Fuse Box 10

10F1 IQAN XA2:A0	20A
10F2 IQAN LX0-LX1 levers	3A
10F3 IQAN MD3 display +15	3A

Fuse Box 11

11F1 X31:1	3A
11F2 crane move end slow	3A
11F3 IQAN XA2:A1	20A

Fuse Box 12

12F1 EHS gearbox control unit	2A
12F2 EHS gearbox control unit	15A

Fuse Box 13

13F1 Glow	150A

Fuse Box 14

14F1 PC	15A
14F2 Printer	7.5A
14F3 phone/Sunit modem	7,5 A

Do not fit an oversized fuse as it may damage the respective electrical instrument. If a fuse blows on the same location repeatedly, find out the reason for it.

Battery

The gas generated by the battery is very explosive. Avoid open fire and sparks in the vicinity of the battery.
When servicing an electrical instrument, disconnect the negative cable of the battery.

Checking of the charge state of the battery

During harvesting the engine recharging equipment keeps the battery charged. At other times, check the state of the battery at regular intervals and recharge if necessary. An acid gauge may be used for checking. In the table below you can see the charge state of the battery compared with the acid specific weight.

Specific weight reading	Charge state
1 280	Fully charged
1 240	75 % ”
1 200	50 % ”
1 160	25 % ”
1 120	No charge

Do not leave a flat battery unused for a long time. A low-charged battery freezes easily and exposure to frost will cause extensive damage. If a recharging device is available, recharging can also be done at home.

Before starting to recharge:

- Disconnect the battery cables
- Unplug the cells
- Make sure the fluid level is high enough

Use 5-10 % of the Ah of the battery for charging current. For example: A 100 Ah battery may be recharged using 5-10 ampere current. Recommended recharging interval is 6-10 weeks.

Cleaning of battery and other maintenance

Clean the battery cover regularly.
Remove any oxidisation off the battery terminals and cable lugs.
Make sure the cable lugs are properly tightened.
Coat the outer faces of the terminals and lugs with Vaseline. Check that the battery is properly fastened and the terminals protected. Make sure the rubber mat is on the battery.
Check the fluid level a few times a year and before storage. Add distilled water, if necessary, up to the upper fluid limit.
NOTE! Wrong connection of either the battery or the generator will damage the generator.
Before electrical welding, disconnect the battery and generator cables.
Check the condition of the cable insulation and the protective cables on a regular bases and repair or replace any necessary parts.

Using of auxiliary battery

If additional power is needed for starting, proceed as follows:

As a source of additional power use 24 V input for example: another 24V vehicle, start-booster or two 12V batteries in series. Make sure the harvester batteries has not frozen; a flat battery freezes in -10°C.

Follow carefully the connecting sequence given below:
1. Connect the auxiliary starting cable to the positive pole of the additional power source. Connect other end of the cable to the 30-pole of the main switch (that is +24V cable from harvester batteries.
2. Connect one end of another auxiliary starting cable to the frame of the harvester (same point where batteries grounding is located). Connect the last end to the negative pole of the additional power source.

Do not lean over the batteries while making the connections.
Start the engine.
Disconnect the cables in exactly the opposite order.

Installation of additional electrical instruments

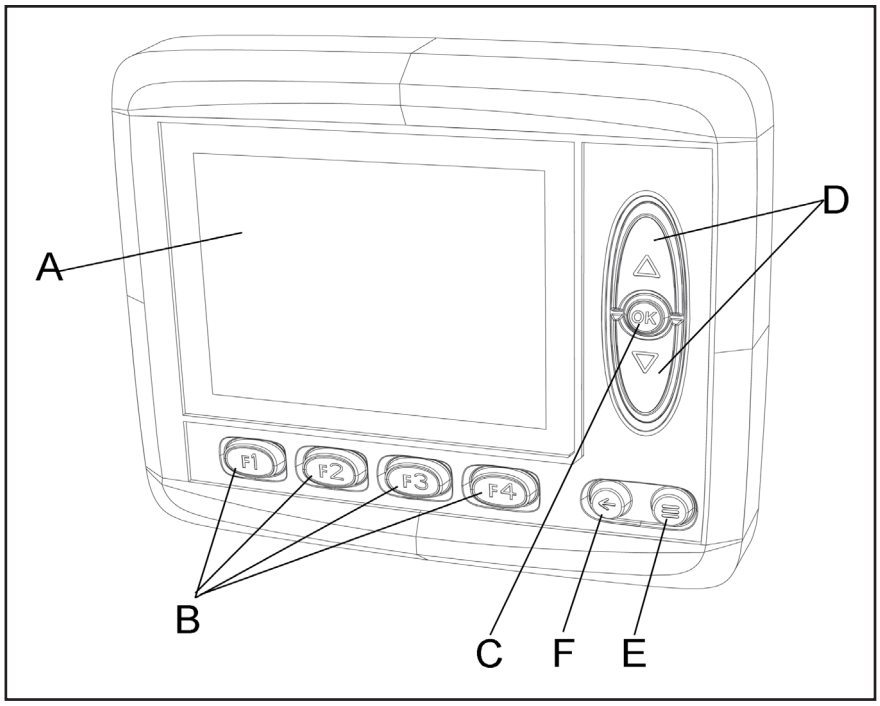
When installing additional electrical instruments onto the harvester, make sure the size of the charge generators is 2x100 A. The total consumption of a base forest harvester in the dark is 120-150 A consisting mainly of the following:

Headlights	11.7 A
Working lights	82.5 A
Gauge lights	2.0 A
Three-speed cab fan	13.5 A
Harvesting computer	3-15 A
Hydraulics	2-16 A
Joystick functions	5 A

Electrically controlled diesel engine

The control center is located on the rear frame on the right above the fuel tank. The casing houses the IQAN-XT2 control unit. If the engine becomes aware of any malfunction, engine diagnosis signal light Q (fig. 2) will come on.

Iqan control system

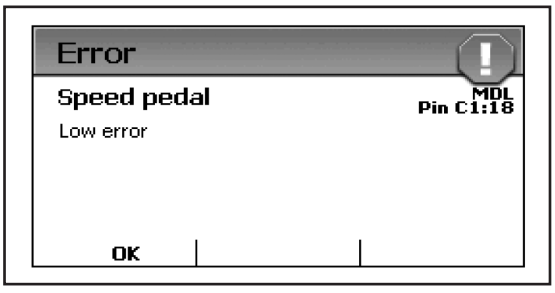


The Iqan monitor consists of the following elements:
- monitor display A
- bottom F1-F4 buttons B
- OK button C and the arrow buttons above and below it D
- Menu button E at the bottom right (three horizontal lines)
- Back button F (arrow to the left)

The display brightness can be adjusted by pressing the Menu button and selecting the backlight setting

SAFETY SYMBOLS

Various notifications and warnings can be displayed in the Iqan monitor. They appear in separate windows partly covering the basic display. The F1-F4 buttons of the display are used to select the most suitable option at the bottom of the warning window. For example, the sensor error in the picture here can be reset by selecting OK, or pressing the F1 button.



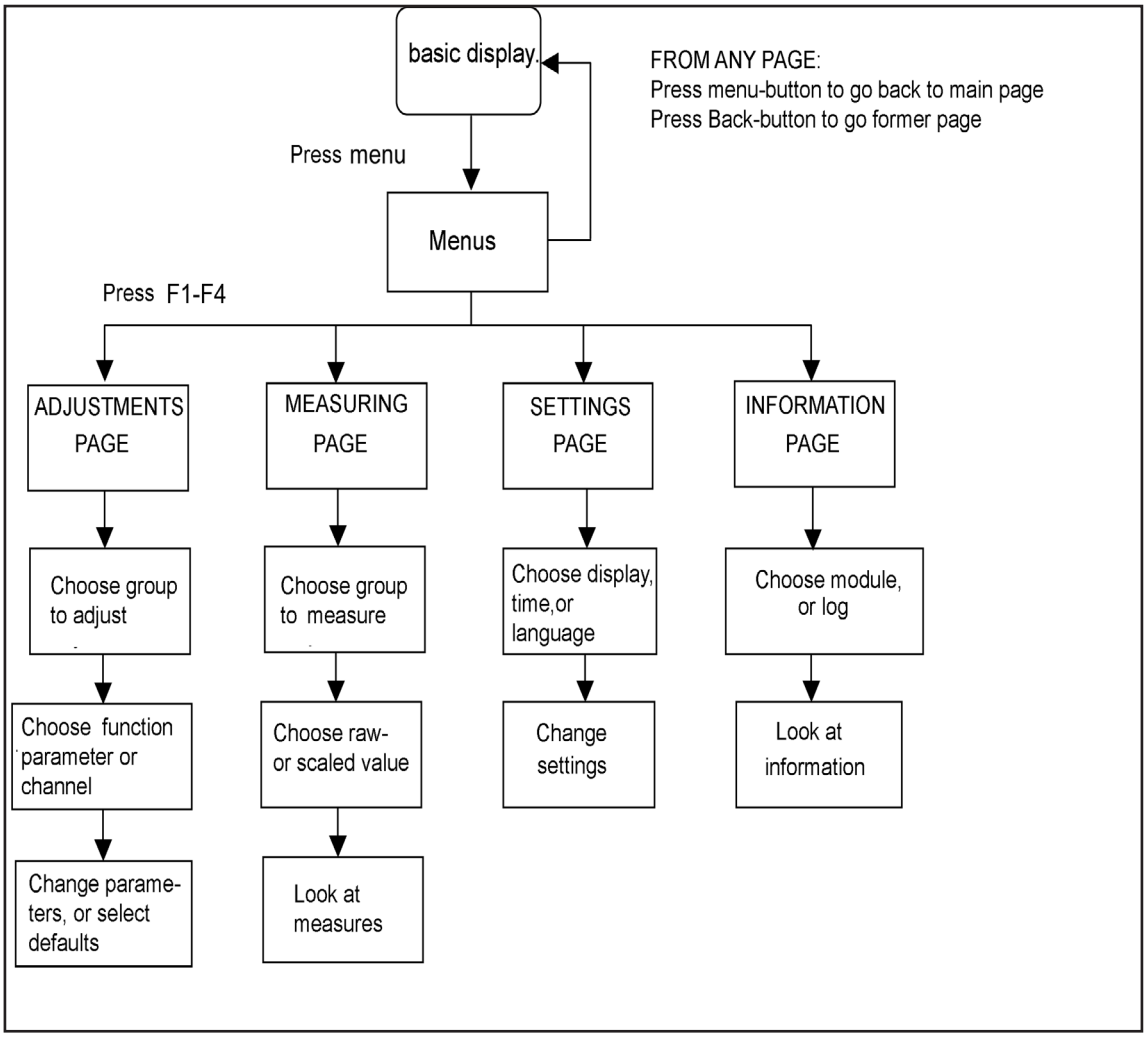
There are seven types of notifications and warnings. The type Message is the least serious and Critical is the most serious. The important notifications are always shown before the less critical ones. The following is a list of all notifications and warnings in the order of importance.

- message
- information
- confirmation
- warning
- alarm
- error
- critical

The notifications and warnings detected by the Iqan machine control system are always messages, alarms or errors. The notifications and warnings from the diesel engine and base machine are primarily information and warnings.

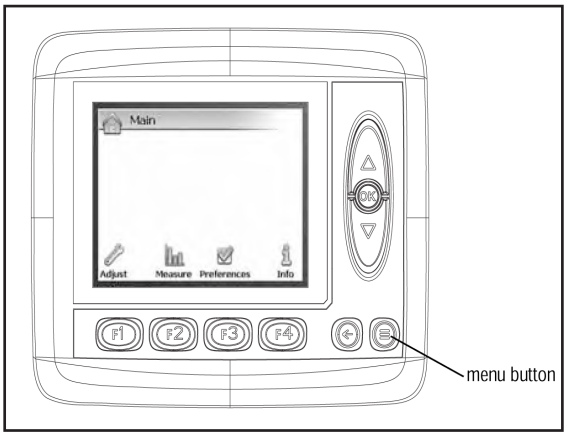
IQAN DISPLAY MENUS

The Iqan display has a graphical user interface and a menu structure. The menu structure is shown in figure 26.



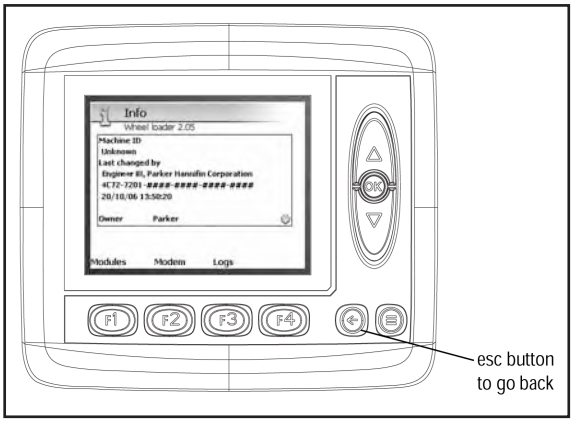
MAIN MENU

The menus contain the base machine setup, input and output measurements, settings and module status and related logs. The menus can be accessed by pressing the Menu button (three horizontal lines). Pressing the Menu button again takes you back to the basic display.



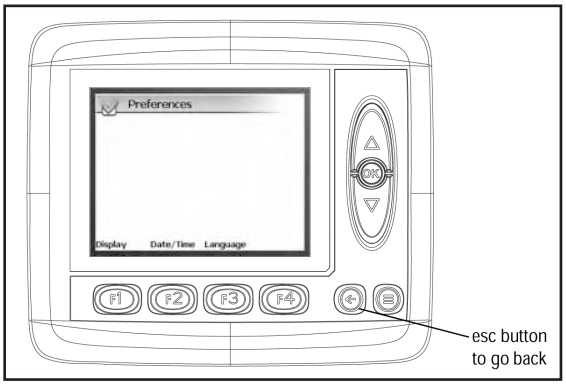
SYSTEM INFORMATION

When you press the F4 button in the main menu, you can view system information such as the name of the software loaded in the monitor, author of the last revision and the date of the revision. By pressing F1 or F3 you can view information on modules or log. The Back button takes you back to the previous page. Pressing F1 on the subpages takes you directly back to the main menu.



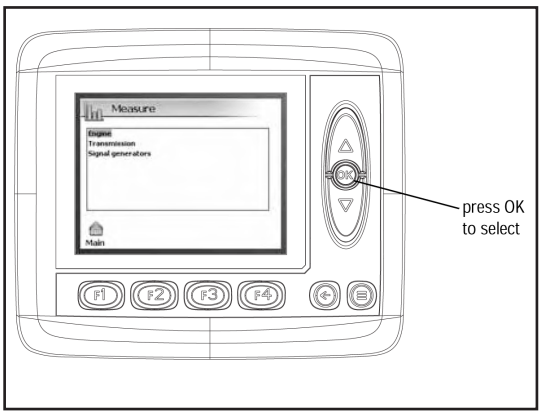
SETTINGS

You can change the display settings by clicking the F3 button in the main menu. Then by pressing F1, F2 or F3 you can view information on the display, date and time as well as language. The Back button takes you back to the previous page. Pressing F1 on the subpages takes you directly back to the main menu.



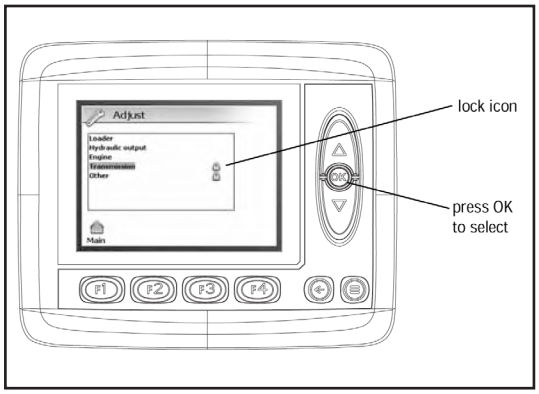
MEASURING

You can measure the sensors and valves connected to the Iqan control system by pressing F2 in the main menu. First, a page with different measurement groups such as crane, joysticks, steering/rotator etc. opens. The desired measurement group is selected with the up/down arrows and by pressing OK. Use the arrow buttons also to select a measurement route such as a sensor or valve. You can toggle between the raw value provided by the route and the scaled value using the F2 button. The Back button takes you back to the previous page. Pressing F1 on the subpages takes you directly back to the main menu.

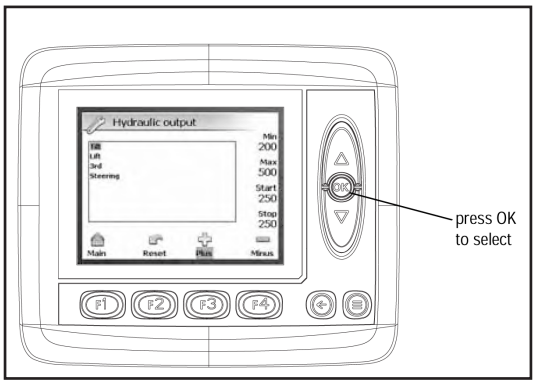


ADJUSTMENTS

You can access several outputs and parameters in order to adjust them by pressing the F1 button in the main menu. First a page opens on screen with a number of adjustable groups such as crane adjustments, driver selection, function parameters etc. The desired adjustment group is selected with the up/down arrow buttons and by pressing OK. A lock symbol may be displayed behind the adjustment group name. This means that a password is needed for adjustments.



After selecting the adjustment group, select the desired measurement route such as a sensor or valve using the arrow buttons. Several instruments have two different directions of movement. The correct direction +/- is selected with the F3 or F4 button. The current adjustment values are displayed on the right side of the display. After you have selected the desired route and direction, press OK.



Adjusting a parameter

You are now on the page where the actual adjustment is done. You can move from one parameter to be adjusted to the next by pressing the OK button repeatedly. When you are at the parameter you want to adjust, press the up or down arrow button. The parameter value on screen changes with each time a button is depressed. You may reset to the default values at any time after the adjustment by pressing the Reset button, or F2. The Back button takes you back to the previous page. Pressing F1 on the subpages takes you directly back to the main menu.

INTERNAL DIAGNOSTICS OF THE IQAN DISPLAY

The Iqan display has its own diagnostics page showing information on the status of the display. You can access the diagnostics page by pressing the Back and the Menu buttons simultaneously while switching on the power. To exit the testing mode, switch off the power and switch it on again normally.

INSTRUMENT PANEL DISPLAY

The left side of the instrument panel display shows the diesel engine revolutions both as a tachometer and as numerical values.

SUBMENUS

The images and text at the bottom of the main display indicate the functions of the F1-F4 buttons in each display. The purpose of these submenu displays is to provide you with some of the most important facts collected on templates.

Adjustments

When pressing the F2 button in the main menu, a window opens in which you can select the crane adjustments.

When pressing the F4 button in the main menu, a window opens in which you can select the parameters

Diesel temperatures, oil pressure and operating hours

When you press the F1 button in the main display, a page opens displaying the diesel engine coolant temperature, fuel temperature, intake air temperature and oil pressure.

When you press F1, you can view the total hours, operating hours and working hours.

The total hours indicate the time that the machine power has been on. The operating hours indicate the time the diesel engine has been on. The working hours indicate the time the diesel engine's speed has exceeded 1,200 rpm. You can return to the main display from the subpages by pressing the F4 button.

Drive pressures

Pressing the F3 button in the main display opens a window showing the status of the drive pressures. You can return to the previous page from the measurement pages by pressing the Back button.

Parameters in the IQAN control system

Numerous parameters, power settings and delays affecting the harvester functions can be set on the IQAN-MD3 display module. Instructions for the display are given in a separate IQAN-MD3 leaflet. Below you will find a list with explanations of the parameters that can be set on the display.

JS TRIGGER + [%]	If the joystick is turned to the right more than the % value, the harvester head rotator will start rotating to the right.
JS TRIGGER – [%]	If the joystick is turned to the left more than the % value, the harvester head rotator will start rotating to the left.
TILT UP SETTING [1/0]	With the value at 50 or more, the harvester head automatic tilt up is in use after the head open function. With the automatic tilt up it is also required that the head open button or lever is pressed for more than 0.7 seconds.
TILT DOWN SETTING [1/0]	With the value at 50 or more, the harvester head automatic tilt down is in use after the head closed function. With the automatic tilt down it is also required that the head closed button or lever is pressed for more than 0.7 seconds. This function can only be activated with mini levers.
LIFT POWER LIMIT	The movement speed of crane lift slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect.
STEERING POWER	The movement speed of frame steering slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect.
TILT POWER LIMIT	The movement speed of crane tilt table slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect.
JIB POWER LIMIT	The movement speed of crane jib slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect.
SWING POWER LIMIT	The movement speed of crane swing slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect.
EXTENSION POWER LIMIT	The movement speed of crane extension slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect.
DRIVE 1050 LIMIT [%]	Driving speed slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect. This value is effective when diesel revolutions are low.

DRIVE 2250 LIMIT [%]	Driving speed slows down to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the effect. This value is effective when diesel revolutions are high. The change between this and the previous value is linear.
WORK PUMP MIN ANGLE	The working pump decreases output (=angle) to the value set at this parameter when diesel revolutions decrease in a load situation. The smaller the value, the smaller the pump angle in a load situation. In other words, small value = big effect
REAR PUSH%	Fine adjustment of the oil going to the rear traction motors. With the value set at 100%, the rear tries to rotate at the same revolutions as the front. A bigger value makes the rear propel the harvester. At a smaller value the rear ”drags” slightly behind.
INNER TYRE STEER LIMIT [%]	When using articulated steering, the rotation speed of the inner wheel is decreased to the value set at this parameter. This fine adjustment improves driving comfort at the moment.
OUTER TYRE STEER LIMIT [%]	When using articulated steering, the rotation speed of the outer wheel is decreased to the value set at this parameter. This fine adjustment improves driving comfort right at the moment.
END CUSH. [%]	Articulated steering slows down to the value set at this parameter when the joint is fully turned.
END CUSH ANGLE [°]	Articulated steering starts slowing down as the joint turns beyond this degree.
CABIN SLOW [%]	The value that affects the movement speed of the cab automatic return to mid position. The bigger the value, the higher the movement speed near mid position.
CABIN IN MIDDLE [°]	Cab tilt sensor deviation from mid position. The smaller the value, the closer to mid position the cab tries to get automatically. Too low a value causes a continuous search for cab mid position.
JIB FILTER [%]	Dampening of vibration in crane jib. Prevents hand vibration from resulting in crane vibration. The bigger the value, the stronger the hand vibration that is dampened.
SWING FILTER [%]	Dampening of vibration in crane swing. Prevents hand vibration from resulting in crane vibration. The bigger the value, the stronger the hand vibration that is dampened.
LIFT FILTER [%]	Dampening of vibration in crane lift. Prevents hand vibration from resulting in crane vibration. The bigger the value, the stronger the hand vibration that is dampened.
STEERING FILTER [%]	Dampening of vibration in frame steering. Prevents hand vibration from resulting in crane vibration. The bigger the value, the stronger the hand vibration that is dampened.

TILT TABLE FILTER [%]	Dampening of vibration in crane tilt table. Prevents hand vibration from resulting in crane vibration. The bigger the value, the stronger the hand vibration that is dampened.
EXTENSION FILTER [%]	Dampening of vibration in crane extension. Prevents hand vibration from resulting in crane vibration. The bigger the value, the stronger the hand vibration that is dampened.
DRIVING FILTER [%]	Dampening of vibration in driving. Prevents foot vibration on the drive pedal from changing driving speed. The bigger the value, the stronger the vibration that is dampened.
FB-TILT ENDING TIME	The cabin can't always be straightened horizontally on a steep hill. This parameter sets the time after which automatism stops and accepts that cabin did not straighten completely.
FB-CABIN VIBRATION TIME	Short-term swings do not put automation on again. This parameter sets the length of time in question.
LEVER SELECTION [1/0]	The value for the mini levers and EME levers should be 1

Service and maintenance

Safety

Installations and adjustments may be carried out only by a person with the required skills and qualifications and the necessary knowledge of the machine in question.

Installations and adjustments as well as repairs must be carried out when the engine is stopped and the key removed from the ignition. Moving parts must be in balance and stopped,and when necessary, locked.
For example, the crane and harvester head may move or slide on their own over time.

Make sure that there is no stored pressure in the fluid systems before you open mechanical or hydraulic joints (pressurized oil tank, harvester head pressure battery, AC equipment, radiator etc.)
Make sure there is no danger of injuries if you need to start the engine while performing maintenance and also after maintenance work.

Ensure that all periodic maintenance work and cleaning are performed on schedule in accordance with the instructions. This reduces the risk of danger caused by malfunctions.

Proper maintenance and service guarantee a long working life and the validity of the warranty.

General instructions:

· Make sure you are sufficiently qualified before you perform maintenance tasks. If you are not sure, have the work performed by a qualified individual.
· Familiarize yourself with the structure of the harvester and the maintenance instructions before you start the maintenance work.
· Wear protective clothing suitable for the work
· Use appropriate tools and other equipment.
· Handle the machine to be maintained and the substances used as instructed so that there is no danger to yourself, other people or the environment.

Service measures daily or every 8 hours

1. Checking of the engine oil level

Stop the engine on level ground and wait for a few minutes. The oil level shall be between the marks on the dipstick. Fig. 26.

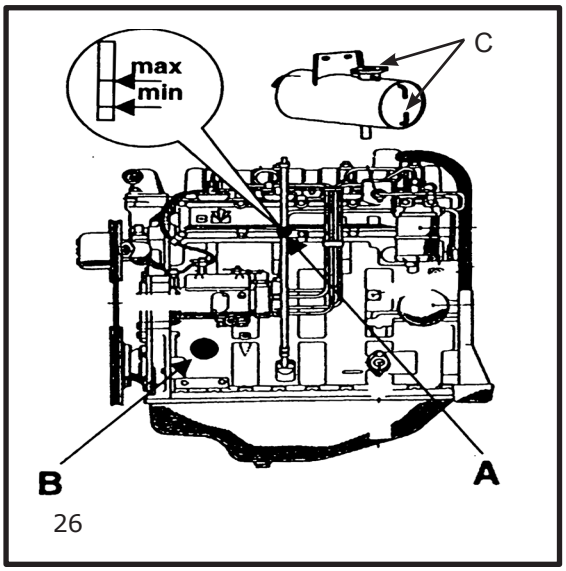


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Fig. 26
A Oil measuring dipstick
B Oil filler
C Coolant check / refill

2. Checking of the coolant level

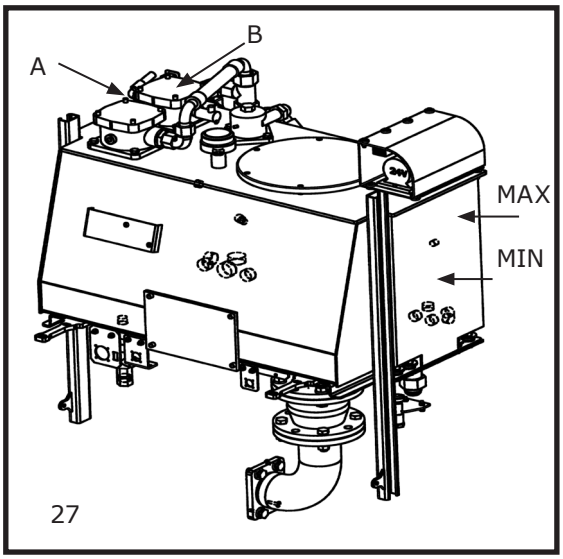
Note! Open the over-pressurised radiator cap with great care when the engine is hot.
Never use plain water as coolant!
Do not pour cold coolant into a hot engine.
The coolant level shall be approx. half way up the expansion tank.
Coolant is added through the expansion tank.
Make sure there is anti-freeze in the radiator in the cold season.

3. Checking of the hydraulic oil level

Check the hydraulic oil level in the measuring glass on the tank with the lift cylinders in their inner position.

Note! The oil level shall always be visible in the measuring glass.

Oil shall always be refilled using filler pump hose A. Oil can also be added through filler B capped with a hexagonal screw in the return filter. Fig. 27. This will leave all the impurities in the filter.



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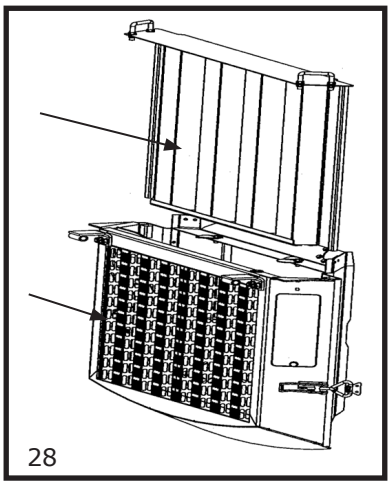
4. Daily lubrication

Lubricate the daily lubrication points in compliance with the lubrication table. See Lubrication Table.

5. Cleaning of radiator grilles

Depending on the operating environment, the radiator grilles shall be cleaned often enough to prevent the engine from overheating. Clean the rear cog screen and the removable grille using compressed air or a brush (fig. 28). When necessary, clean the oil and engine condensers.
Note! The rear cog and the grilles must not be covered with the engine running.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6. Checking of tyre air pressure

Check the tyre air pressure and external condition visually. Check the air pressure if necessary. The correct air pressure for the 600/65-34 tyres is 2.5 bar, the 700/55-34 tyres a minimum of 2.8 bar.

7. Checking for leakage

Check for any liquid, fluid and oil leakage.

8. Checking of connections

Check the screw and pipe connections visually.

NOTE! During the first operating month the tightness of the screw connections in the crane, shafts and joint shall be checked daily.

It is important to tighten the screw connections to the correct torque. The required wrench sizes and torques:

Screw size	Wrench size (mm)	Tightening torque for screws of 8.8 strength class (Nm)
M 6	10	11
M 8	13	25
M 10	17	47
M 12	19	78
M 14	22	120
M 16	24	180
M 20	30	335

NOTE! Tightening torques for wheel fixing screws

Front wheels: 700 Nm
Rear wheels: 700 Nm

Service measures weekly or every 50 hours

1. All daily service measures

The service measures to be taken every 50 hours include all the measures listed in service measures daily or every 8 hours.

2. Lubrication in compliance with the lubrication table

Lubricate in compliance with the lubrication table paying attention to any special instructions. See the lubrication table.

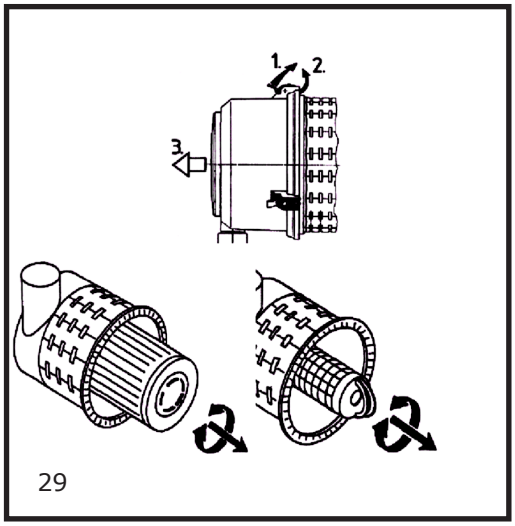
Service measures every 100 hours

1. Cleaning of engine air filter

The engine suction air is cleaned by a pre-filter and a dry paper filter of a dual-element type. Faultless functioning of the filter is of utmost importance to the long lifespan of the engine.

The filter housing is located in the engine compartment. The instrument panel has a signal light indicating a clogged air filter. The indicator measures under pressure in the suction channel. The signal light is red, when the filter needs cleaning.

The filter housing cover is fastened with locking brackets and the filter cartridges are under the cover (fig. 29). The outer filter cartridge shall be replaced when blockage is indicated or at least once a year. The outer cartridge can also be cleaned, but no more than five times. Open the locks on the rear filter cover and twist the cartridge out of the housing. Be careful not to damage the paper. Do not remove the inner cartridge unless it needs replacing. The filter protects the suction channel against impurities during service.



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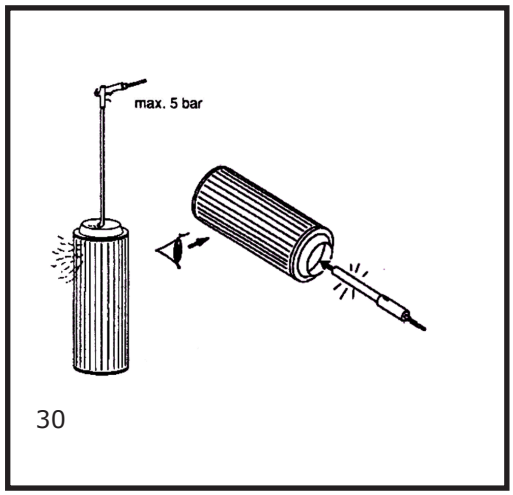
Blow dry compressed air (not over 5 bar) inside the filter. Great care shall be taken not to damage the filter cartridge or allow dust inside.

After cleaning, check the condition of the filter. Direct a strong light from the inside. In case the outer filter cartridge is broken, it shall be replaced. The inner filter shall also be replaced as it has become dirty. Otherwise the inner cartridge is replaced after five filter services or every other year.

Clean the inside of the filter housing carefully before removing the inner cartridge. When refitting the filters, make sure that the gaskets are intact, the mating surfaces clean and that the filter fits well.



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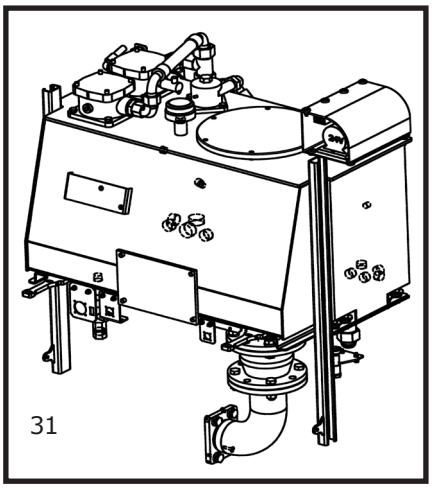
When servicing the filter, check the condition and attachment of the air hoses and the cleanliness of the hose in the exhaust fume ejector.

NOTE! Never run the engine without filters.

2. Checking of battery fluid level

Clean the battery housing carefully. Check that the battery fluid level is 5-10 mm above the cells. Make sure the cable lugs are properly tightened. Remove any oxidisation with hot water. Coat the cable lugs with copper or aluminium paste.



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3. Cleaning of breather on the hydraulic tank

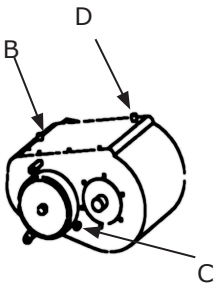
Clean the filter and the surrounding area carefully (fig. 31).

4. Checking of the condition of traction transmission

Check the attachment of final drives, drive shafts and gearbox. Ensure there are no cracks. Check the attachment of the hydraulic pump and motors in traction transmission. Check for leaks in hose connections.

5. Cleaning of cab air filter

Remove the cab fresh air filter with its housing and clean it carefully with compressed air. Replace a soiled or broken filter. The paper filter shall be replaced at least once a year. Check also the condition of the air intake suction channel.



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6. Checking of gearbox oil level

Check the oil level in filler C. Oil level shall be level with the rim. If necessary, add oil in filler B until oil runs out of the control opening. Check and clean breather D on the cover. Add the type of oil specified in the oil table (fig. 32).

7. Checking of light operations

Make sure the headlights, working lights, turning signals and signal lights function properly. When replacing bulbs, comply with the Manufacturer´s recommendations.

8. Draining of water out of water separator

The fuel pre-filter with water separator is located on the left side of the engine. Drain any accumulated water into a dish weekly. Replace the filters in compliance with the service table or more often if you suspect a clogged filter. Fault code "Fuel pressure low" indicates a clogged pre-filter or air leakage in the pipes. When changing the filter, remember to take the metal water separator plug from the old filter.
Used filters are problem waste that must be dealt with accordingly. For further instructions, refer to the engine manual.

32.2

9. Checking of oil level in final drives

Check the oil level in filler B. Oil level shall be level with the rim. If necessary, add oil in filler C until oil runs out of the control opening. Refit the breather and control plug and wipe off excessive oil (fig. 33).

10. Checking of brake functions

Both working and parking brakes shall be checked regularly. The fluid level in the front brakes shall be above the minimum level (fig. 34). Ensure there is no leaking. If something needs to be done with parking brakes, it is good to know that parking brakes are released when the lever beneath the brake drum is in its mid position. Deflection in either direction engages the brakes

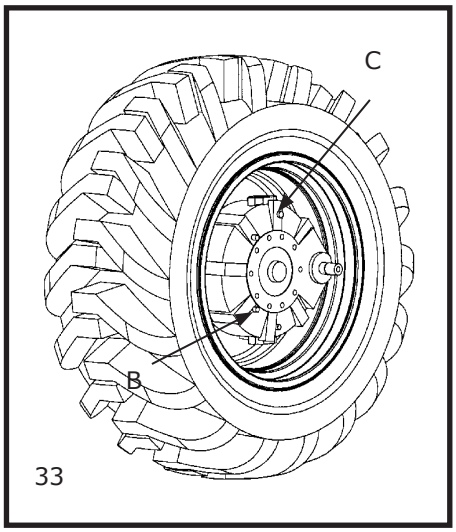
11. Checking of belt tension

Check the tension of belts in the water pump, generator and optional air conditioner. The tension is correct when there is a deflection of 15-20 mm when pressing with your thumb. Replace worn and damaged belts (fig. 35).

12. Cleaning of polycarbonate windows

Remove any particles that may damage the window surface. Avoid using any sharp objects. Use mild and environmentally friendly detergents and plenty of water for washing. Substances suitable for removing stains include pure isopropyl alcohol, white spirit, heptane, white gas, butyl etylene glycol, methanol, hexane and butanol. Use plenty of water for rinsing after the removal of stains.

NOTE! Do not use other solvent substances such as gasoline for cleaning windows.



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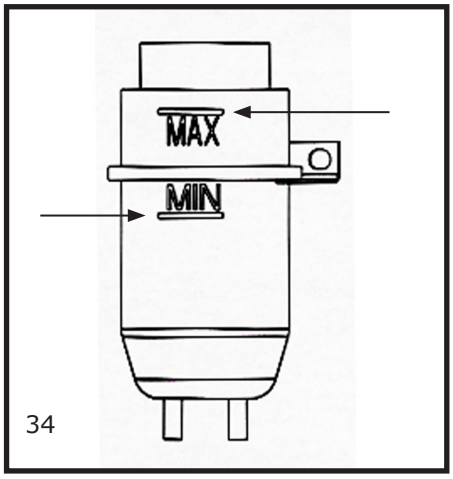

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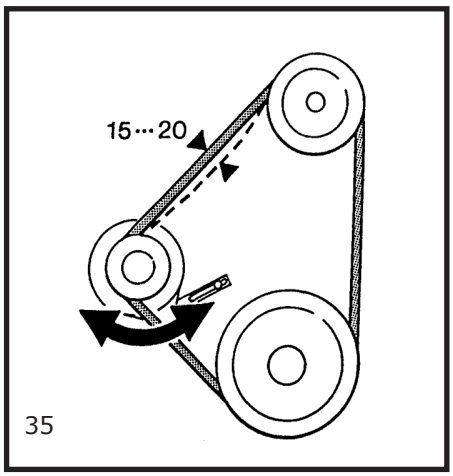

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Service measures every 500 hours

1. All daily and weekly service measures.

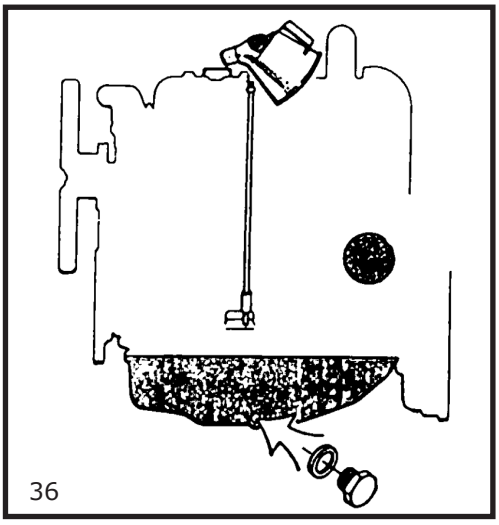
The service measures to be taken every 500 hours include all the measures listed under service measures daily or every 8 hours as well as the measures listed under service measures weekly or every 50 hours and every 100 hours.

2. Changing of engine oil and filter

Run the engine until it warms up. Open the drain plug in the under pan and the drain screw on the banjo connection in the engine sump. Drain the oil into a pan. When all the oil has been drained, close the drain plug and the screw (fig. 36).
The oil filter is replaced every time the oil is changed. Clean around the oil filter. Remove the old filter using a filter key. Coat the gasket on the new filter lightly with new oil (fig. 37) and make sure the gasket surfaces are clean. Attach the filter manually. Wipe off any excessive oil. Pour new oil in the filler up to the top mark on the dipstick. Pay attention to the amount of oil poured into the filter.
Acceptable oil brands and amounts are given in the lubrication table and the engine manual. For further instructions, see the engine manual.

NOTE! Only use types of oil recommended by the Manufacturer!

Check the engine breather pipe every time the oil is changed. The pipe shall be clean inside and it must not be dented.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3. Changing hydraulic oil filter after first 500 hours

See instructions for changing a filter in section '**Service measures every 1 000 hours**'.

4. Using of additional heater outside the heating season

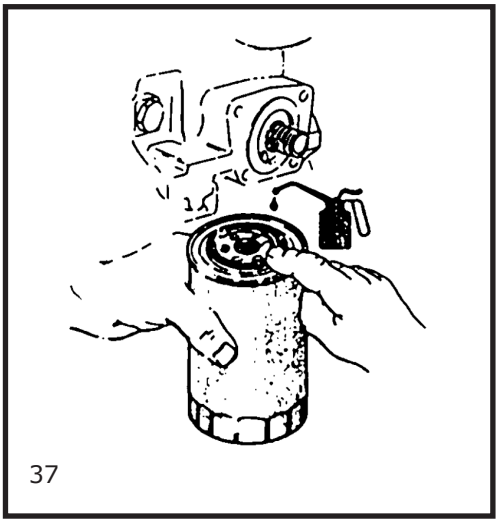
The heater shall be used about once a month outside the heating season, too, to prevent the fan motor and water pump from becoming stuck.

5. Checking bolts after first 500 hours

Check tightness of the bolts in crane, brakes, final drives, wheels and joints after first 500 hours.

6. Adjusting the diesel engine valves

Adjust the diesel engine valves after the first 500 operating hours and then every 1000 operating hours.
For detailed information, see the engine manual.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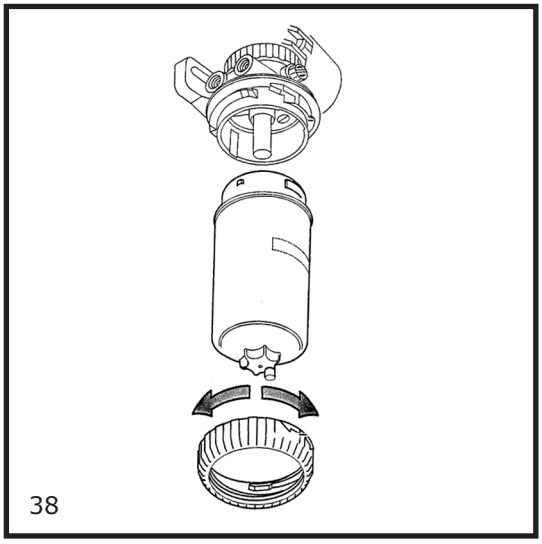
Service measures every 1000 hours

1. All service measures to be performed daily, weekly and every 100 and 500 hours

The service to be performed every 1000 hours includes all the service measures listed under service measures daily or every 8 hours, service measures weekly or every 50 hours and service measures every 500 hours.

2. Changing of fuel filter and pre-filter (water trap)

See instructions in the engine manual, (fig. 38).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3. Draining of condensed water out of the fuel tank

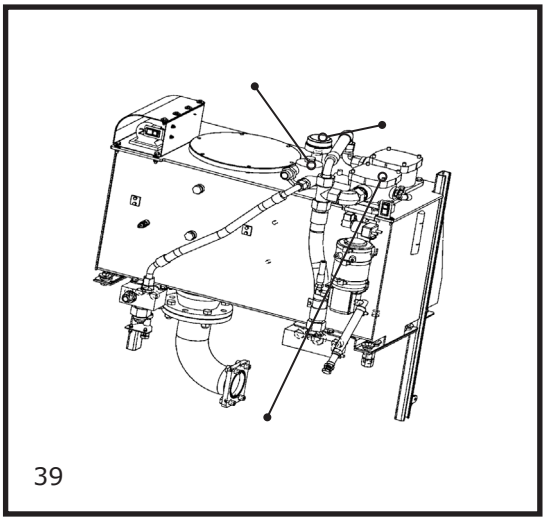
Run a little fuel from the filler at the front of the fuel tank into a pan. Remove water at least once in a year.

4. Changing of hydraulic oil filter

Change the filters in working and traction hydraulics (fig. 39).

The hydraulic oil does not need to be drained when the filters are changed.

See further instructions under service mea-sures every 1500 hours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5. Changing of gearbox oil

The oil is drained by unplugging oil drain A (fig. 40). New oil is poured into filler B. Check in control opening C that the oil level is level with the rim. Check and clean breather D on the cover. Oil change every 1000 hours or once a year.

Used oil is problem waste, which shall be disposed of in an appropriate manner.

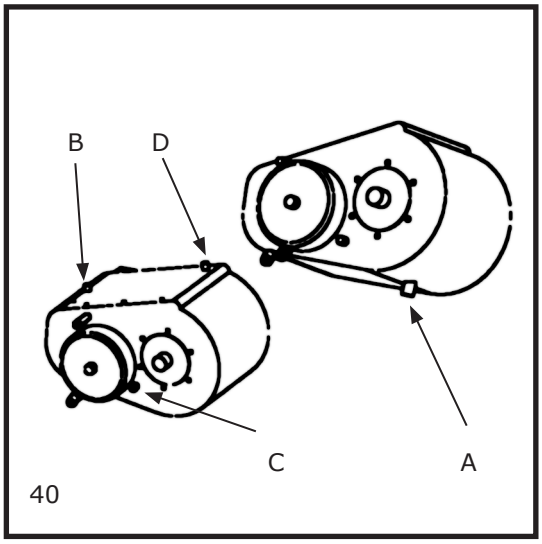
Use an oil type in accordance with the oil table (see chapter **LUBRICATION**).

6. Changing of crane turning motor oil

See instructions in the crane manual

7. Changing of crane turning motor brake oil

See instructions in the crane manual



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8. Checkin condition of hydraulic hoses

Check The condition of hoses. Replace worn out and leaking hoses to New. Replace all hoses with new ones at least once in 15 years.

9. Checking air hoses of cooler and engine

Check hoses visually. Replce with new if needed. Engine's cooling water hoses must be changed at least every five year.

10. Adjust diesel engine valves

See instructions in the engine maual.

Service measures every 1500 hours

1. All service measures to be performed daily, weekly, every 500 and 1000 hours

The service to be performed every 1500 hours includes all the service measures listed under service measures daily or every 8 hours, service measures weekly or every 50 hours and service measures every 500 and 1000 hours.

2. Changing of oil in final drives (fig. 41)

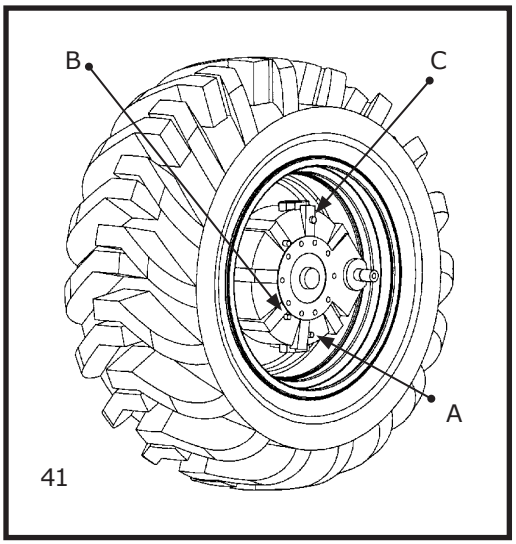
Clean around control opening B, breather C and oil drain A. Open the drain and drain the oil into a pan. Add oil in the breather. The oil level should come up to control opening B. Refit the cleaned breather and control plug.
Used oil is problem waste, which shall be disposed of in an appropriate manner.
Use an oil type in accordance with the oil table.

3. Changing of hydraulic oil and filters

Traction and working hydraulics have a joint oil tank. Oil should be changed at least once a year. Before changing the oil, run the system until it is warm and adjust all the cylinders in their shortest position.

Oil is drained from the system by unplugging the drain plug at the end of the drain hose. Have a sufficiently large pan handy, as there is approx. 200 litres of oil. Clean around the filters carefully before removing them.

NOTE! The oil does not need to be drained



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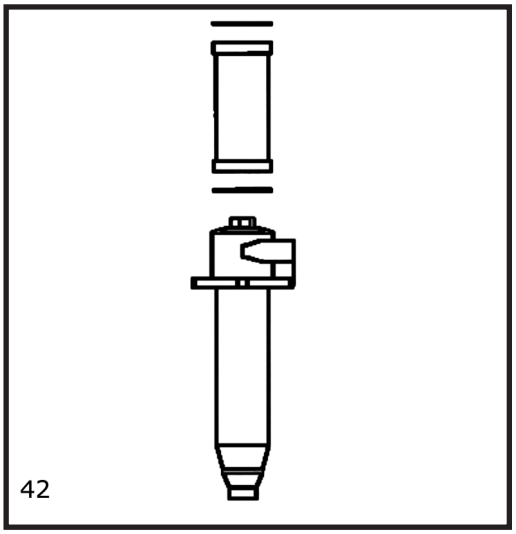
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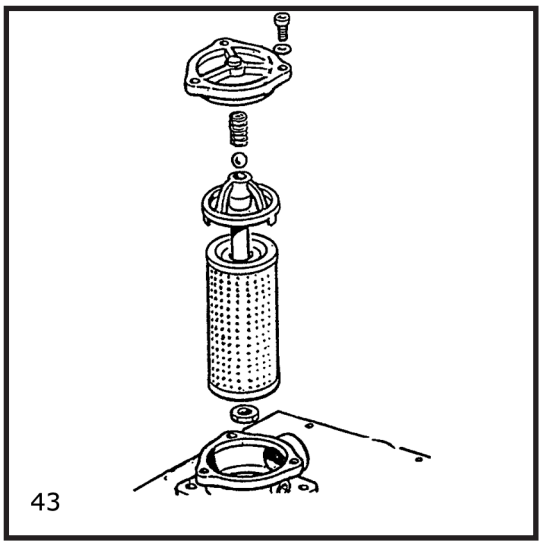
when the filters are changed.

When changing the suction filter, turn the filter cover counter clockwise. Check and, if necessary, replace the gasket on the filter cover before refitting.

To change the return filters, unscrew the four fixing screws on the filter cover. The cover is spring loaded, which means the screws shall be unscrewed evenly. Remove the fixing nut at the bottom of the filter element and change the filter cartridge (fig. 43).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Use only genuine filters and oil types in compliance with the oil table to guarantee perfect functioning. Make sure there are no impurities in the oil or the funnel.

After the oil change let the engine idle for approx. 30 minutes, during which time hydraulics must not be used. During this period the oil circulates through the filter several times and any impurities in the oil are filtered off. Monitor the oil level and check for any leakage in the filter.

There is a glass gauge on the side of the oil tank to monitor the oil level. The oil level shall be visible in the gauge window. Add oil, when necessary.
REFILL ALWAYS THROUGH THE RETURN FILTER PLUG USING AN OIL FILLER PUMP!

At the base of the oil filter there is an alarm switch to indicate pressure loss through the filter. In case the alarm light is on in the cab and the oil is in its operating temperature, the filter cartridge is clogged and shall be replaced.

In case of over-heated hydraulic oil

Hydraulic oil temperature should not exceed 70 degrees C. A temperature increase of 10 degrees cuts the oil lifetime in half. When the signal light comes on, hydraulic oil temperature is 90 degrees. In this case you should wait long enough to let the temperature drop.
The engine can be kept running, but unloaded. Find out the reason for the excessive oil temperature. The most common reason is blockage in the radiator and its protective screens.

4. Checking of the functions of hydraulic signal lights

Earth the sensor cables of suction, pressure and return filters. The signal lights on the instrument panel should come on.

5. Checking condition of hydraulic hoses

Check The condition of hoses. Replace worn out and leaking hoses to New. Replace all hoses with new ones at least once in 15 years.

SERVICE MEASURES EVERY 2000 OPERATING HOURS

1. Inspect and clean the diesel engine injectors (EEM3 service tool)

SERVICE MEASURES EVERY 4000 OPERATING HOURS

1. Check compressor clearances / check the cleanliness of the intercooler element
For detailed instructions, see the SisuDiesel manual.

Service measures every 5 000 operating hours

There is a torsional coupling between the engine flywheel and the work pump shaft. Replace the coupler every 5 000 hours to prevent sudden breakage.
Remove the pumps together with the pump fixing plate attached to the flywheel casing.
The toothed steel hub on the pump shaft needs to be replaced at the same time with the plastic element.

Service measures every 6 months

The fire extinguishers shall be serviced every 6 months or more often if so stipulated in local regulations or terms of the fire insurance.

Service measures every 1 year

If the harvester is equipped with an automatic extinguishing system, it shall be serviced as instructed by the Manufacturer. See servicing of the fire extinguishing system in the operator manual. In some countries terms of insurance requires yearly inspection of the vehicle.

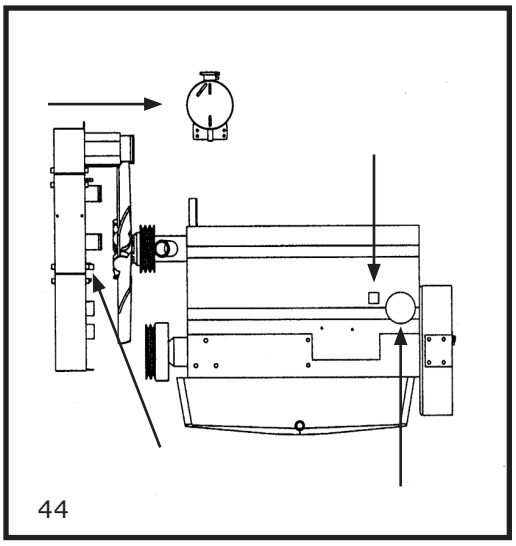
Service measures every 2 years

1. Replacement of the AC drying cartridge

To guarantee faultless functioning of the air conditioning, the drying cartridge needs to be replaced every 2 years.

2. Changing of engine coolant

The coolant shall be changed at least every other year to maintain its anti-corrosion properties. The cooling system is drained by opening the draining taps in the radiator water cell and on the left-hand side of the engine at the rear and by unscrewing the cap in the expansion tank. In order to drain the coolant from the heater cell, too, turn the thermostat to its maximum position. Used coolant is problem waste, which shall be disposed of in an appropriate manner. Therefore the draining taps are equipped with connectors to which a collection hose can be attached to drain the liquid (fig. 44).



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NOTE! See further instructions in the engine manual.

The dual-functioning thermostat must not be removed to reduce the temperature, as this would make most of the coolant circulate through the side circulation pipe, which reduces cooling capacity.

On models equipped with an additional heater, air shall be bled from the heater when more coolant is added. See the heater instructions!

Lubrication

Do not lubricate while the engine is running. Remove the ignition key before starting lubricating. The table below gives recommended lubricants to be used in differrnt temperatures. The table also gives different types of air conditioning liquids, although they do not normally have to be changed.

Recommended lubricant	Oil grade API	Viscosity SAE		Filling quantity l	Change interval
		-25…+30°C	+10…+45°C		
Engine - Common Rail	CI-4	10W40	10W40	Number of (6 syl. = 26 l)	500 h
Gearbox	GL–5	80W90	85W140	7.0	1,000 h
Final drives, front	GL–5	80W90	85W140	7.5 3.0	1,500 h
Final drives, rear	GL–5	80W90	85W140	3.0	1,500 h
Hydraulics [1]	Shell Esso Shell	Tellus S4 VX 32 J–35 TellusOil TX32	Tellus S4 VX 32 J–35 TellusOil TX46	200	1,500 h
Lubrication points	CB/CC	10W30	15W40	–	–
Grease points	Lithium grease	NLGI 2	NLGI 2	–	–
AC oil	PAG	500 SUS	500 SUS	1.8 dl initial fill	–
AC oil	HFC R134a	–	–	1.05 kg	–
Crane turning motor	See the crane manual				1000 h
Chain oil	See harvester head manual				

[1] If you want to use biodegradable hydraulic oils, consult the Manufacturer.

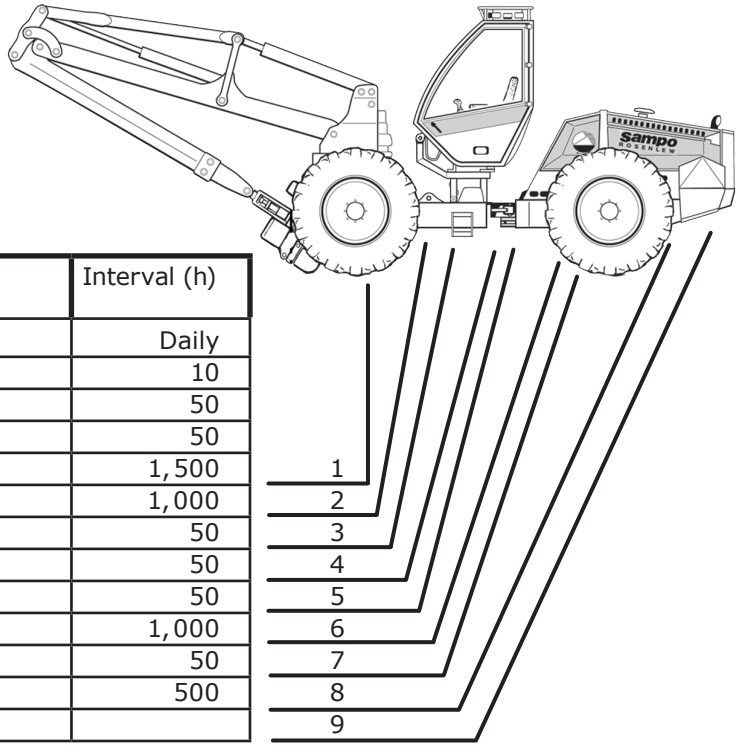
The combine leaves the factory filled with oil intended to be used in temperatures -10...+30°C except with Shell Tellus Arctic 32 in the traction hydraulic system. With refills it is advisable to start using oil types intended for local temperatures.

Initial fills
Engine: Shell Rimula R5 E 10W-40
Gearbox: Shell Spirax HD 80W-90
Hydraulics: Shell Tellus S4 VX 32
Lubrication grease: SHELL Rhodina Grease EP2

The guarantee is valid only when lubricants in compliance with the initial fill lubricants are used!
Correct lubrication is of major importance to the perfect functioning and long working life of the forest harvester, due to which the lubrication recommendations shall be followed carefully while simultaneously monitoring if any place requires more lubrication.

All the lubricants shall be free from impurities. Even the slightest impurities may cause damage. Oil fillers and nipples shall be wiped clean. Apply grease on the nipples in accordance with the lubrication table. Apply machine or engine oil to places to be oiled.

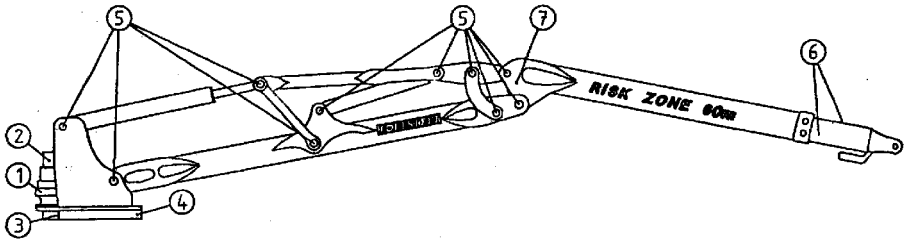
Lubrication diagrams



Ref.	Point	Interval (h)
	Harvester head	Daily
	Crane	10
	Drive shafts	50
	Differential lock	50
1	Final drives	1,500
2	Gear box	1,000
3	Brakes	50
4	Steering cylinders	50
5	Joint	50
6	Hydraulics	1,000
7	Frame lock	50
8	Engine	500
9	AC	

Lubrication of crane and changing of oil in turning motor

Lubricate the crane in compliance with the enclosed table. Use molybdenum grease (~2%) on articulation bearings and crane sliding bearings. Multi-purpose grease can be used elsewhere. Note! It is absolutely forbidden to use greases containing molybdenum sulphide MoS2 to grease the crane slewing bearing. Change the oil in the turning motor gear and brake in spring and autumn or every 1,000 hours. See further instructions in the crane manual.



Ref.	Point	Pcs	Function	Interval (h)
1	Turning motor gear	1	Check / oil change	10 / 1,000
2	Brake	1	Check / oil change	10 / 100
3	Open gearwheel	1	Grease	10
4	Circular bearing	1	Grease with	10
5	Articular - and slide bearings	14	Grese with	10
6	Outer surface of crane extension	1	Grease	50 (SAE 10W50)
7	Inner surface of crane extension	1	Grease	50 (SAE 10W50)

Summary of periodical procedures

The summary always includes checks and service performed at shorter intervals. For more detailed crane and harvester head service instructions, see the respective manuals.

Daily or every 8 hours:

1. Check the engine oil level
2. Check the radiator coolant level
3. Check the hydraulic oil level
4. Lubricate the points to be lubricated daily
5. Clean the coolers and the grille
6. Check the tyre air pressure visually
7. Check for any fluid and oil leakage
8. Check the connections

Weekly or every 50 hours:

1. Lubricate all the points specified in the lubrication table

Every 100 hours:

1. Clean the engine air filter (*)
2. Check the battery fluid level
3. Clean the breather area on the oil tank
4. Check the condition of the power transmission equipment
5. Clean the cab air filter
6. Check the gearbox oil level
7. Check the light functions
8. Check the oil level in final drives
9. Drain water out of the water separator
10. Check the brake functions
11. Check the belt tension
12. Clean the windows

(*) or when the blockage indicator alarms

Every 500 hours:

1. Change the engine oil and filter
2. Run the additional heater also outside the heating season
3. Replace the hydraulic oil filters after the first 500 operating hours
4. Check the hydraulic working pressure and brake pressure
5. Check screw tightness after the first 500 operating hours: the middle joint, brakes, reduction gears, rims and crane

Every 1,000 hours:

1. Change the fuel filter (*)
2. Change the fuel pre-filter (*)
3. Drain condensed water out of the fuel tank minimum once a year
4. Change the oil in the crane turning motor
5. Change the oil in the crane motor turning brake
6. Change the hydraulic filters (**)
7. Change the gearbox oil
8. Check the hydraulic hoses. Replace the hoses at least every 15 years.
9. Check the radiator and engine air hoses visually, replace if necessary. Change the engine cooling water hoses at least every five years.
10. Adjust the engine valves

(*) or when indicated by service code 122 in the engine system

(**) or when the blockage indicator alarms

Every 1,500 hours:

1. Change the oil in final drives
2. Change the hydraulic oil
3. Check the signal light functions

Every 2000 hours

Inspect and clean the diesel engine injectors (EEM3 service tool)

Every 4000 hours

Check compressor clearances / check the cleanliness of the intercooler element

Every 5000 hours:

1. Replace the flexible coupler between the engine and work pump.

Every 6 months:

1. Service the fire extinguisher

Every 1 year:

1. servicing of the fire extinguishing system

Every 2 years:

1. Replace the AC drying cartridge
2. Change the engine coolant

Storage when not in use

In case of a longer storage, the pre-storage service is recommended. The pre-storage service can be divided into three parts, in order of performance: cleaning, checking and protection.

Cleaning:

Dirt is efficiently removed from a dry harvester by compressed air. A high-pressure washer may also be used with caution. To reduce drying time, use warm water. Do not direct water jets at the bearings, as the packing does not hold against a strong spray of water. Apply suitable solvent on heavily greasy spots before washing. Start cleaning from the top. Clean the radiator cells by blowing air from the direction of the wings.

Checking:

Take a pen and paper and write down all the shortcomings and required service measures in the following order:

- Condition of the harvester head
- Bearing clearances and attachments
- Wear, corrosion and dents

It is important to have the recorded defects repaired before storage to ensure the efficient functioning of the harvester in the future.

Protection:

Use engine oil or special protective oil in a sprayer.

Places to be protected:

- Scratched paintwork (paint)
- Electrical connections (special protective spray)

Cab ventilation:

Clean the filters. Clean the air channels and the fan unit with its cells. This may be done with a vacuum cleaner.

Air Conditioning:

Clean the air conditioner condenser and vaporiser cells preferably with compressed air.

Engine:

Clean the engine externally.
Replace the fuel filter.
Change the engine oils.
Replace the engine oil filter.
Check the anti-freezing quality of the coolant.
Clean or replace the air filter.
Clean the cable lugs and apply grease to them.

Electrical instruments:

Clean the battery surfaces, check the fluid level and charge the battery full. Charge the battery every three months.

Recommended accessories

Recommended accessories

- Pulse sensors
- Inductive sensors
- Light bulbs
- Connection relays
- Gaskets and packing

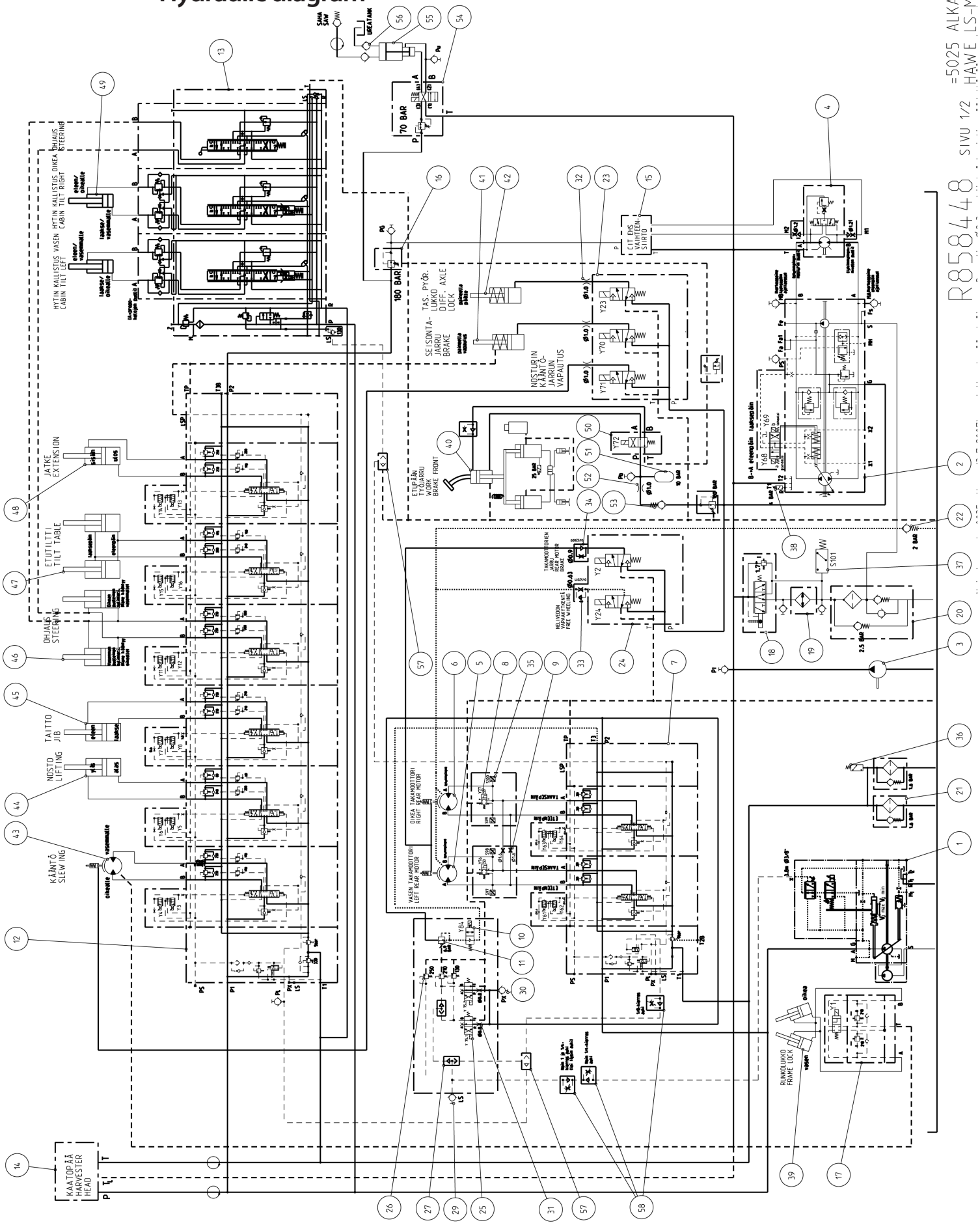
For the saw

- Chains
- Spare guide bar

General Parts

- Hexagonal screws M6-M12, the most common lengths of 16-40 mm, strength class min. 8.8.
- Hexagonal nuts M6-M12, strength class 8. A few lock nuts.
- Washers and spring washers, 6.5-13 mm.
- Spring cotters, 3-8 mm, lengths 20-50 mm.
- Grease nipples 6 mm and 1/8”, straight and angled.
- Fuses 7.5; 10, 15; 25; 40A

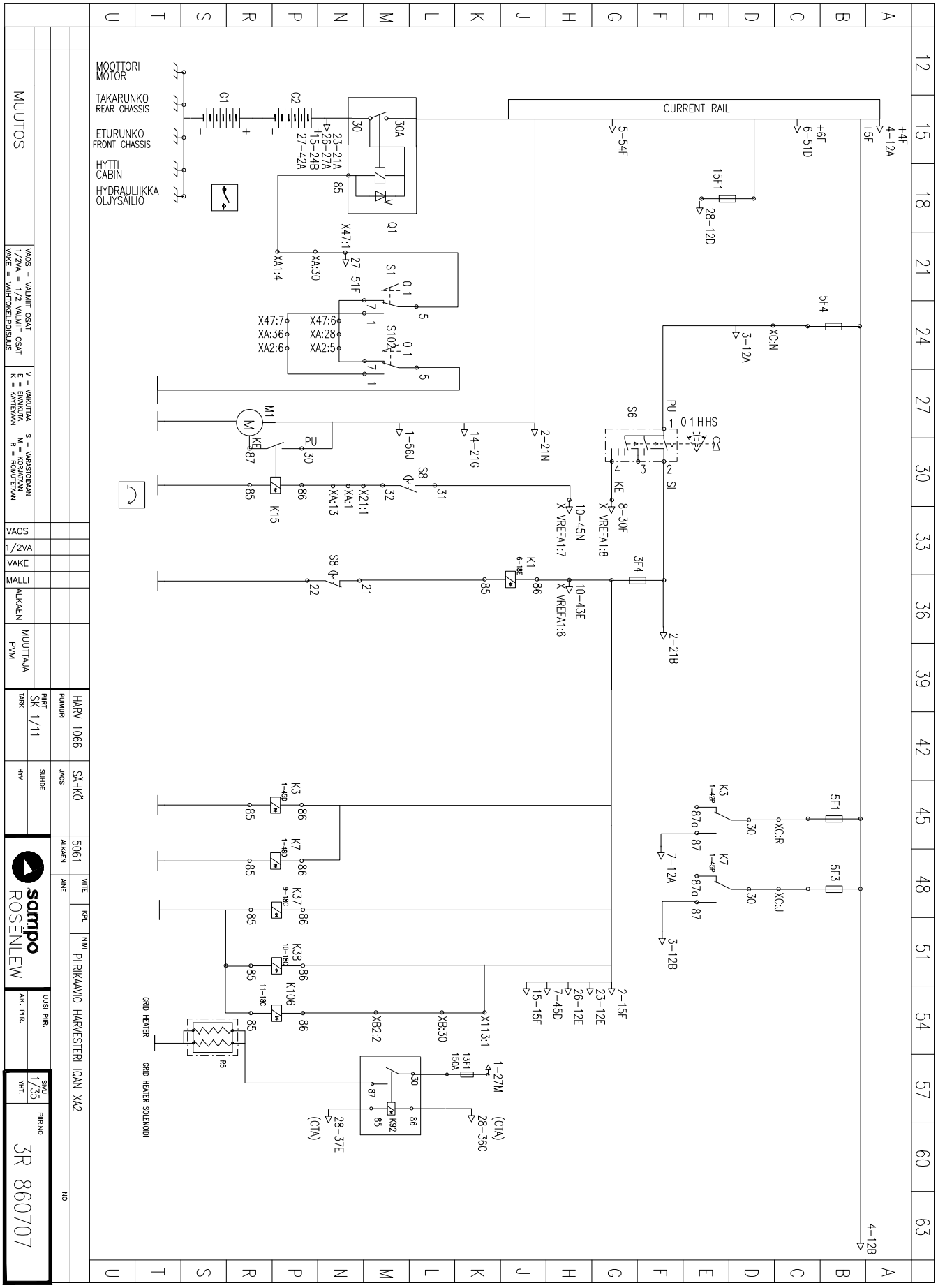
Hydraulic diagram

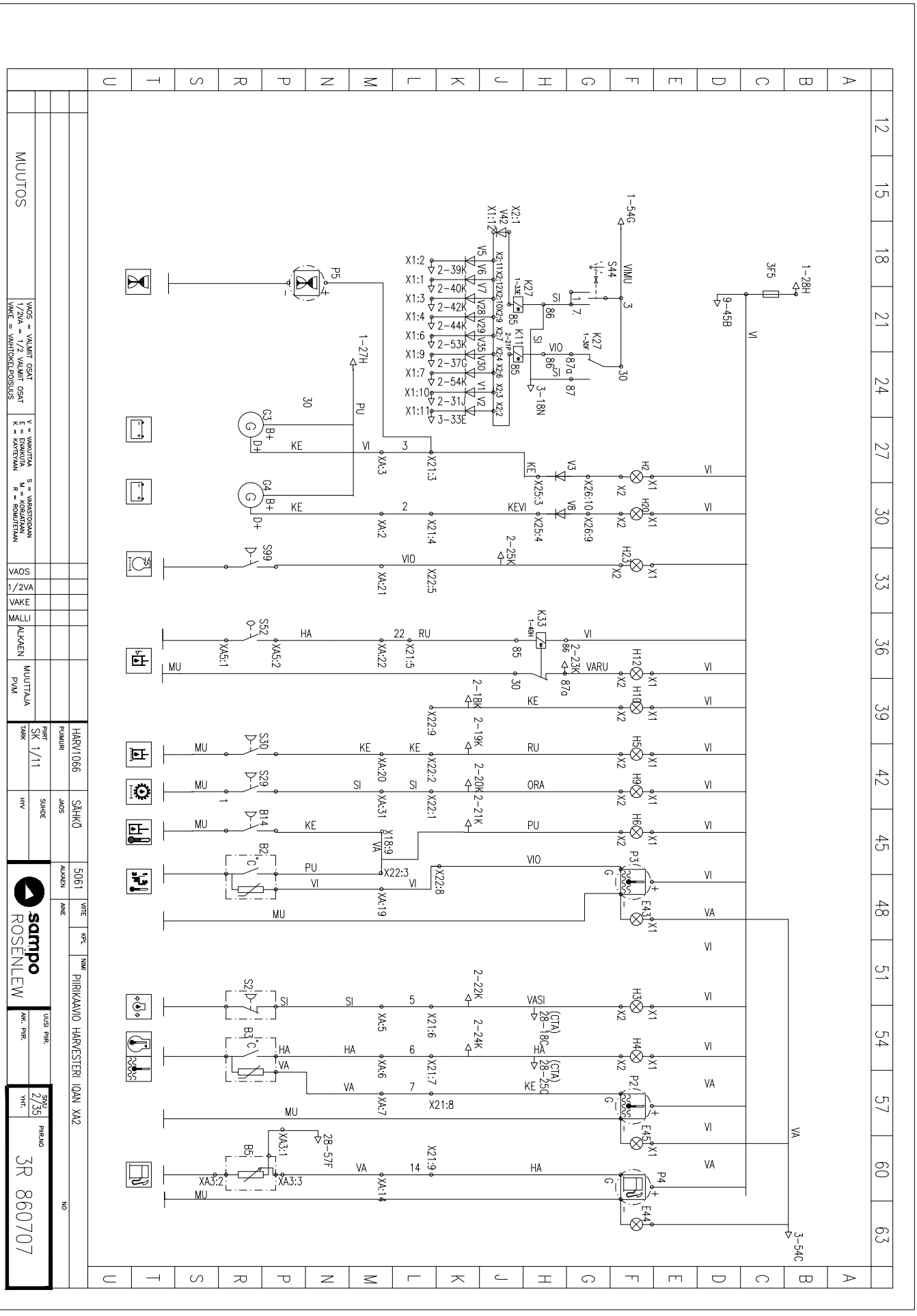


Hydraulic diagram part catalogue SR1066

1. Working hydraulic pump
2. Drive hydraulic pump
3. Oil cooling pump
4. Drive motor
5. Left rear motor
6. Right rear motor
7. Rear drive valve
8. 4/2 industrial valve
9. Orifice
10. On/off cavitation valve
11. Pressure reducing valve
12. Crane valve
13. Cab stabilizer valve
14. Harvester head
15. Gear shifter
16. Pressure reducing valve
17. Frame lock valve
18. Thermostat valve
19. Oil cooler
20. Suction/return filter
21. Return filter
22. Check valve (4WD disengagement)
23. Front low-pressure valve
24. Rear low-pressure valve
25. On/off-harvester head pressurizing valve
26. Pressure relief valve
27. Shuttle valve
28. Orifice (LS)
29. Pressure gauge (LS)
30. Pressure gauge (pump pressure)
31. Orifice
32. Orifice
33. One-way restrictor valve
34. One-way restrictor valve
35. Pressure transducer (drive)
36. Pressure switch (return filter)
37. Pressure switch (suction/return filter)
38. Pressure switch (case pressure)
39. Cylinder (frame lock)
40. Cylinder (front brakes)
41. Cylinder (parking brake front)
42. Cylinder (differential lock)
43. Hydraulic motor (crane turn)
44. Cylinder (crane lift)
45. Cylinder (crane jib)
46. Cylinder (steering)
47. Cylinder (crane tilt table)
48. Cylinder (crane extension)
49. Cylinder (cab stabilizer)
50. 4/2 industrial valve
51. Accumulator
52. Orifice
53. Valve
54. Valve block UREA (accessory)
55. Urea pump (accessory)
56. Valve
57. Shuttle valve
58. One-way restrictor valve

Electric diagram

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ALKAEN
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HARV1066
SÄHKÖ
5061
PIIRIKAAVIO HARVESTERI IQAN XA2
SAMPO ROSENLEW
SIVU 2/35
YHT.
PIIRINO
3R 860707
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9-45B
1-54C
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K11
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X22:3
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P3
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(CTA) 28-18C
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B5
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XA3:2
XA3:3
P4
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H20
H23
H12
H10
H5
H9
H6
H3
H4
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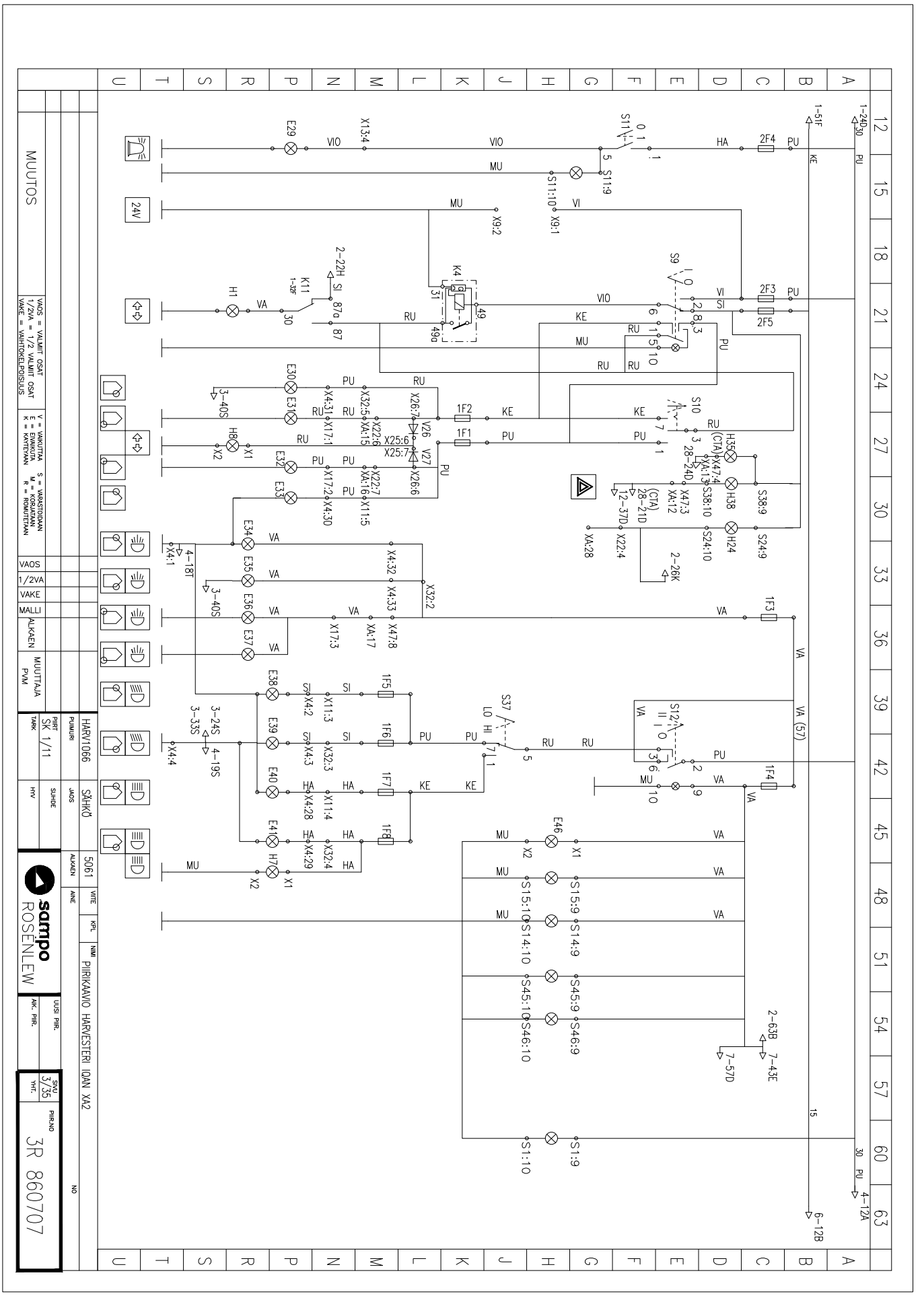
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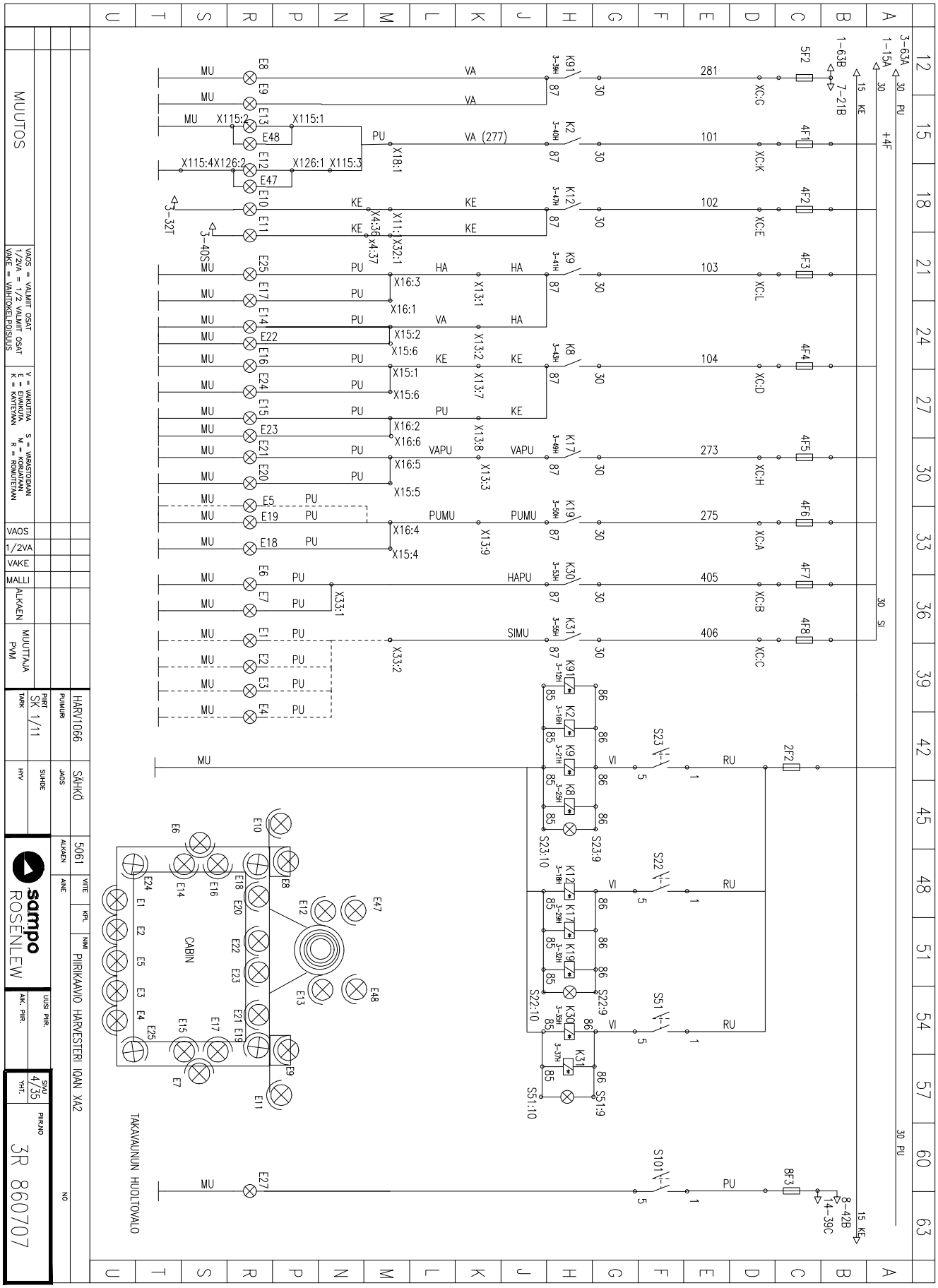
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JAOS
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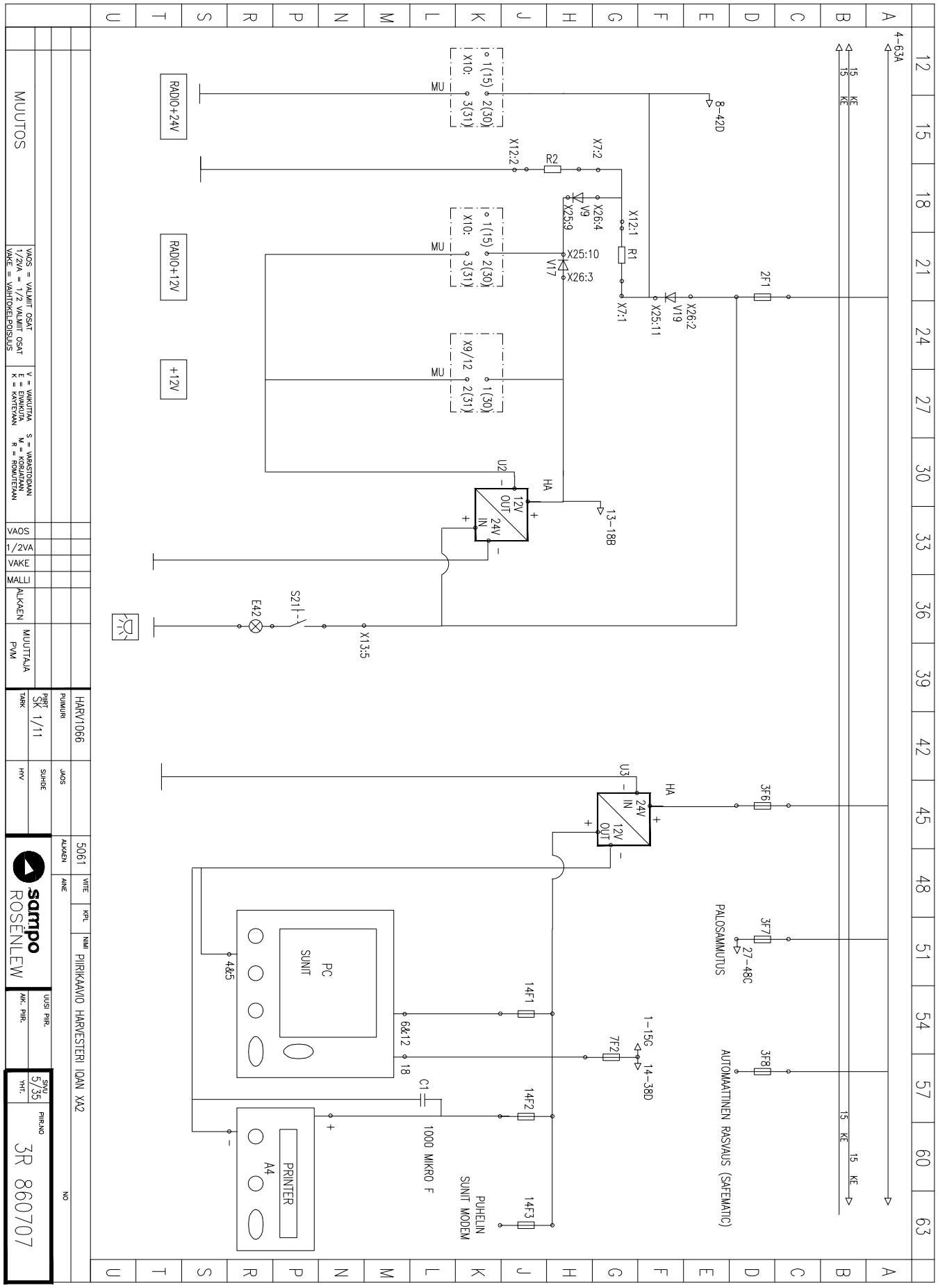
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+12V
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X25:9
X12:1
R1
X7:1
X25:10
V17
X26:3
X26:2
V19
X25:11
2F1
U2
12V OUT
24V IN
HA
13-18B
S21
E42
X13:5
U3
3F6
3F7
27-48C
PALOSAMMUTUS
3F8
AUTOMAATTINEN RASVAUS (SAFEMATIC)
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14F2
14F3
7F2
1-15G
14-38D
6&12
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A4
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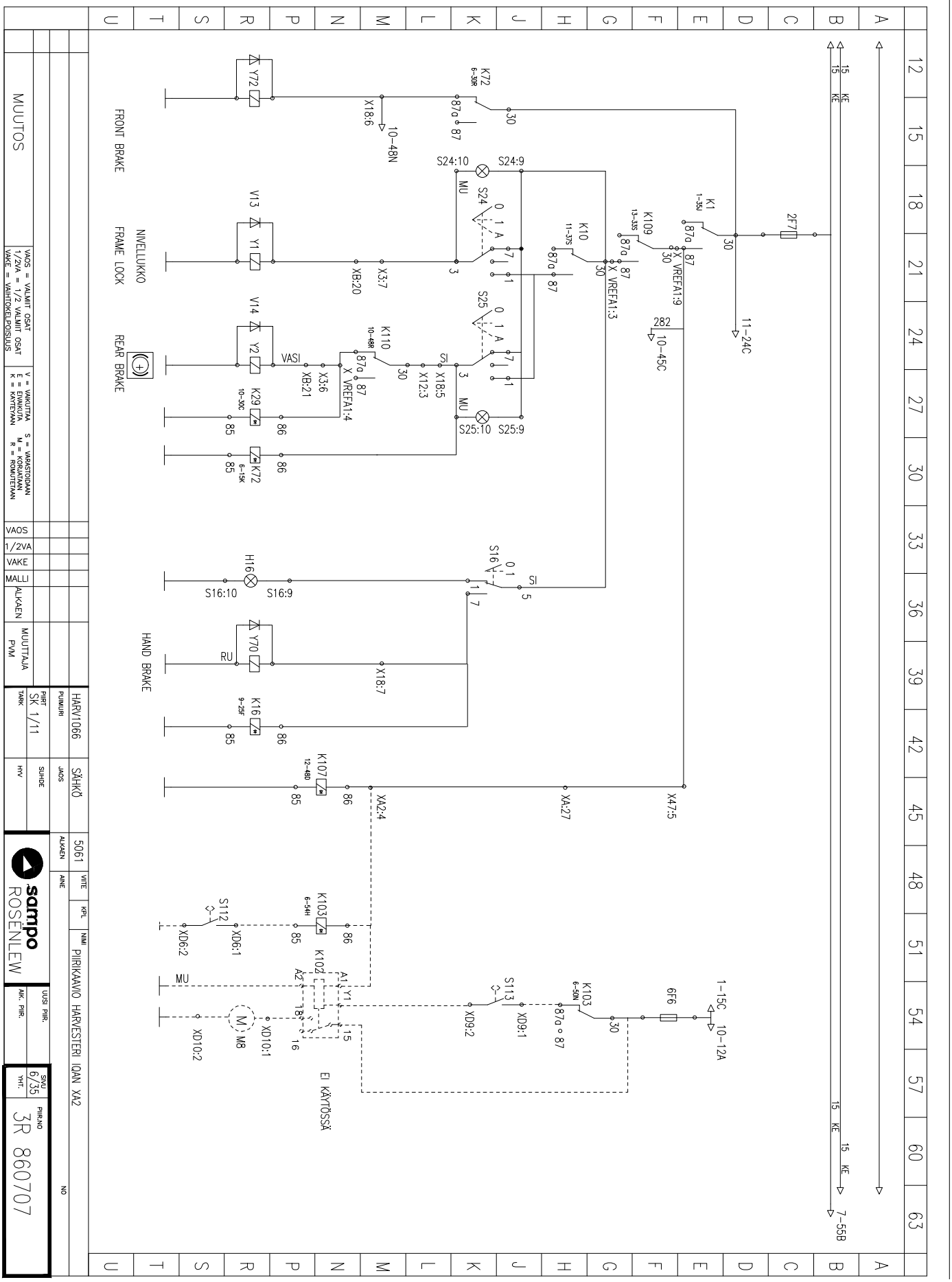
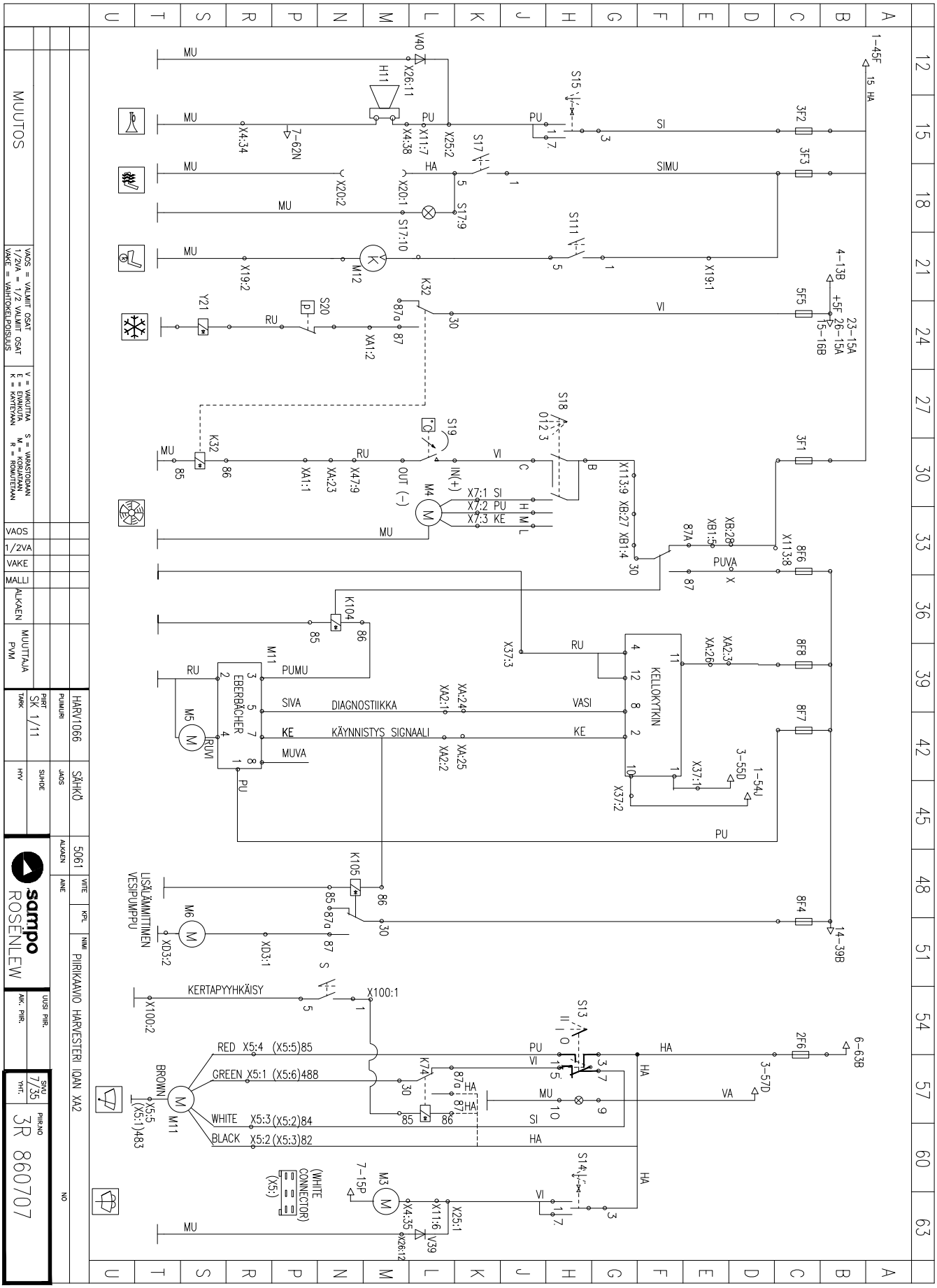
| MUUTOS | | |


FRONT BRAKE
NIVELLUKKO
FRAME LOCK
REAR BRAKE
HAND BRAKE
MUUTOS
PIIRIKAAVIO HARVESTERI IQAN XA2
HARV1066
SÄHKÖ
5061
sampo ROSENLEW
3R 86070707
EI KÄYTÖSSÄ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JAOS
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PIIRIKAAVIO HARVESTERI IQAN XA2
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sampo ROSENLEW
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RUVI
VASI
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DIAGNOSTIIKKA
KERTAPYYHKÄISY
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GREEN X5:1 (X5:6)488
BROWN
WHITE X5:3 (X5:2)84
BLACK X5:2 (X5:3)82
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KELLOKYTKIN
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M6
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M12
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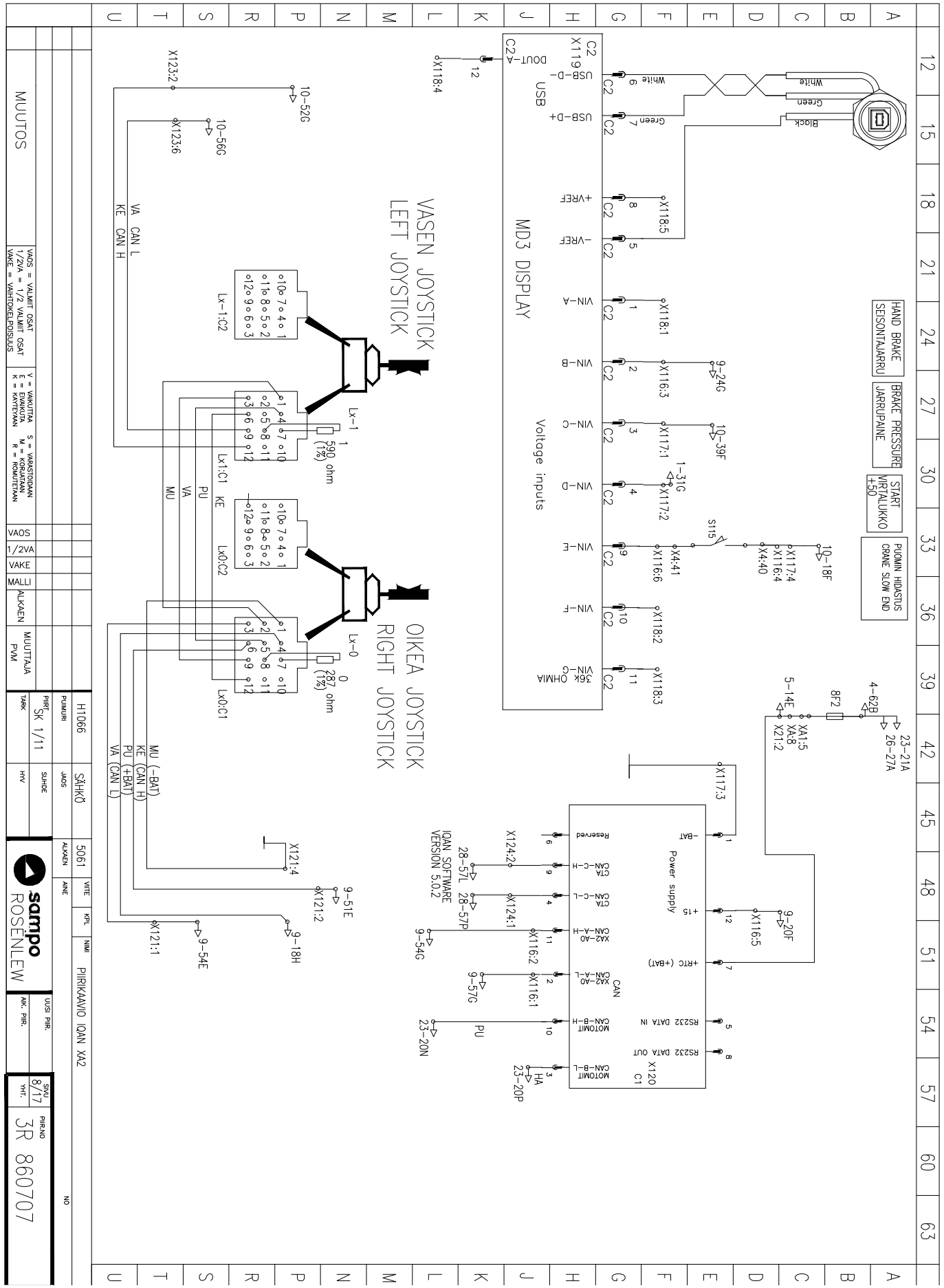
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USB-D+
+VREF
-VREF
VIN-A
VIN-B
VIN-C
VIN-D
VIN-E
VIN-F
VIN-G
Voltage inputs
HAND BRAKE
SEISONTAJARRU
BRAKE PRESSURE
JARRUPAINE
START
VIRTALUKKO
+50
PUOMIN HIDASTUS
CRANE SLOW END
VASEN JOYSTICK
LEFT JOYSTICK
OIKEA JOYSTICK
RIGHT JOYSTICK
Lx-1
Lx-0
590 ohm (1%)
287 ohm (1%)
Power supply
+BAT
+15
+RTC (+BAT)
RS232 DATA IN
RS232 DATA OUT
CAN
MOTOMIT
IQAN SOFTWARE VERSION 5.0.2
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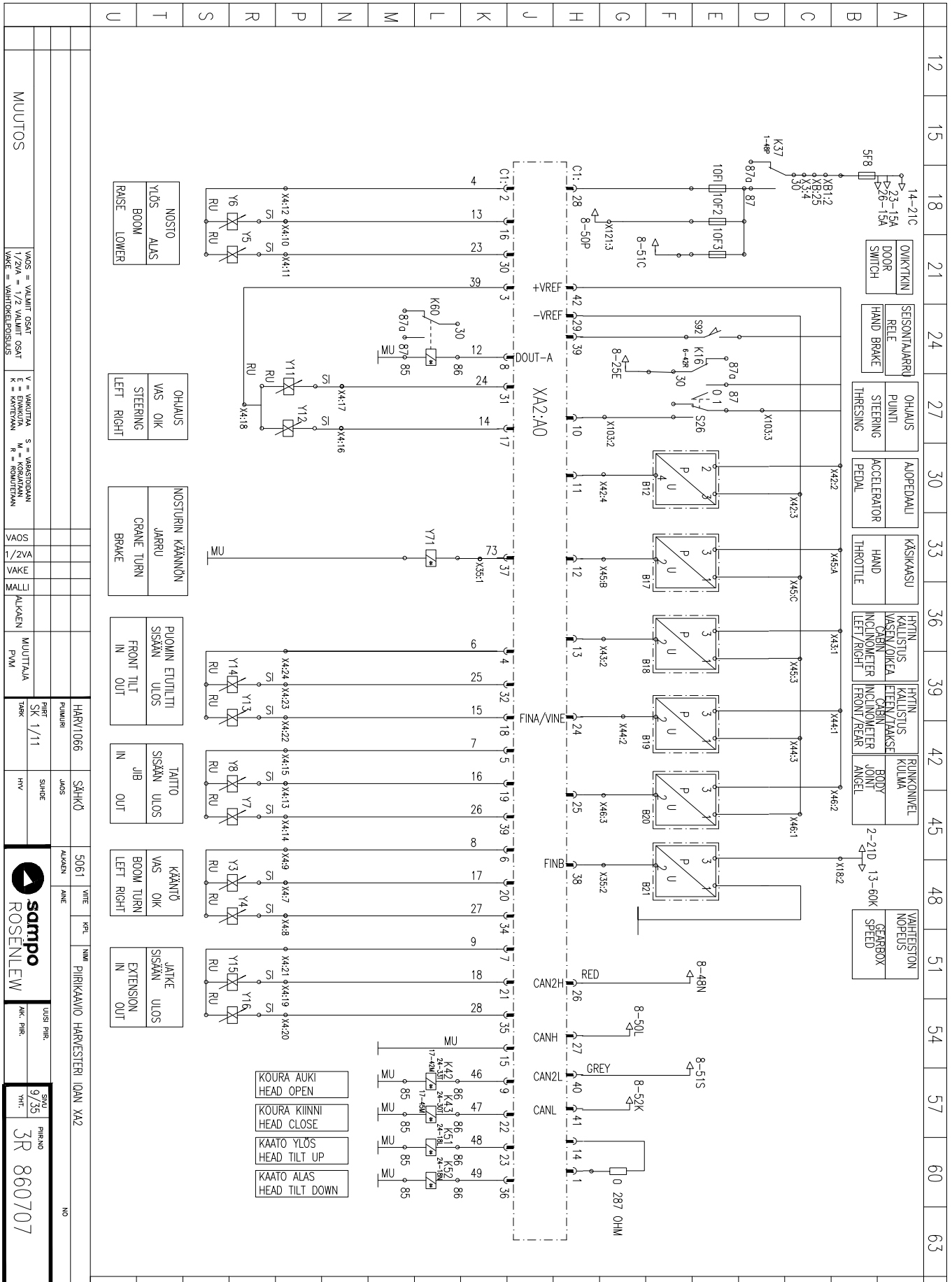

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E = EINAKUTAA
K = KYTKEYTYMÄN

S = VARASTOIMAN
M = KORJAAMAN
R = ROMUTEMAN

VAOS	
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VAKE	
MALLI	
ALKAEN	
MUUTTAJA PVM	

PIIRT	HARV1066
PUIMURI	SÄHKÖ
TARK	JAOS
SK 1/11	SUHDE
HYV	
ALKAEN	5061
ANNE	VITE
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NIMI	PIIRIKAAVIO HARVESTERI IQAN XA2
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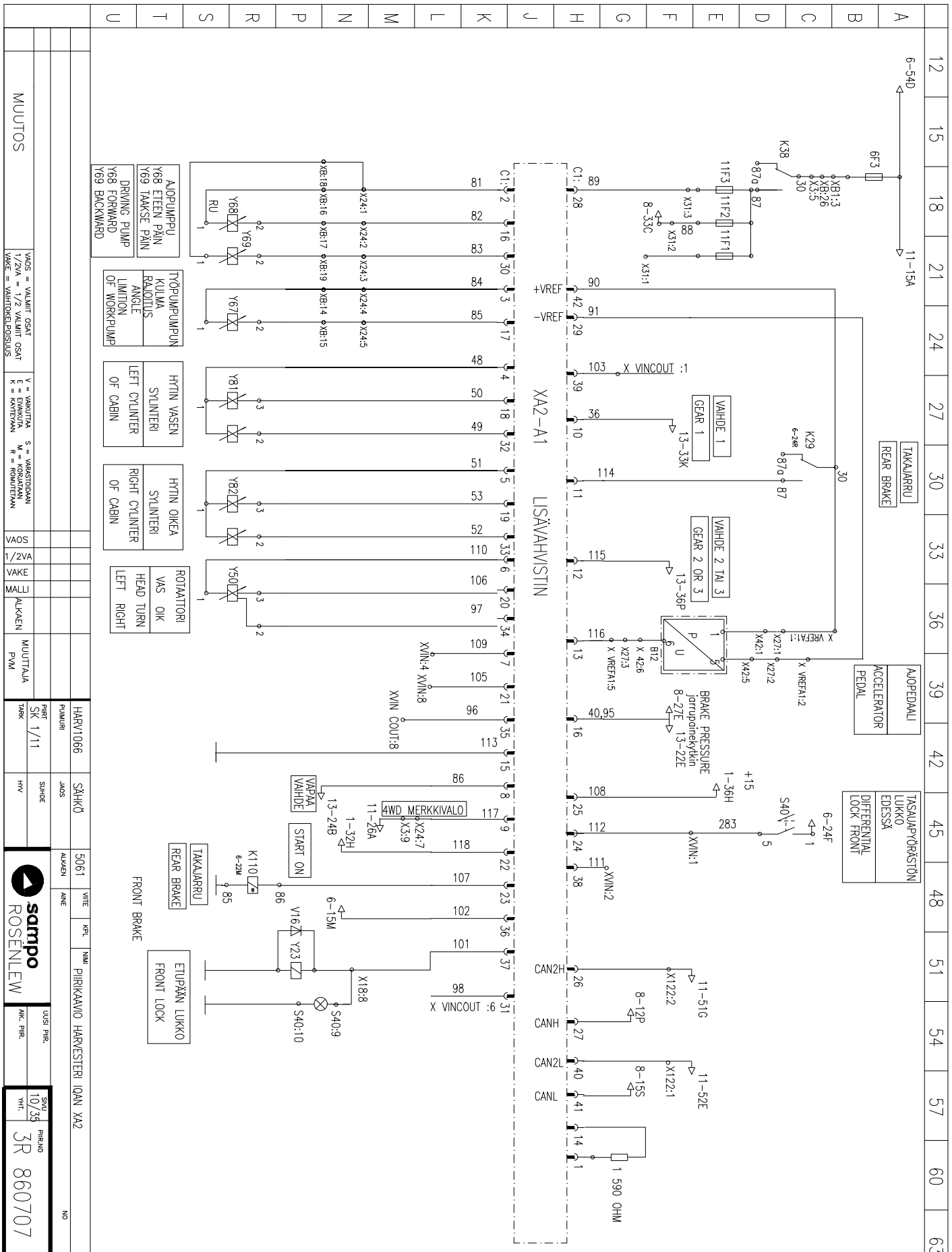

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PIIRT/TARK	SK 1/11	HARV1066	SÄHKÖ	5061	VIITE	
		PUIMURI	JAOS	ALKAEN	AINE	
HYV		SUHDE			KPL	NIMI

PIIRIKAAVIO HARVESTERI IQAN XA2

UUSI PIIR.	SIVU	PIIR.NO
AIK. PIIR.	10/33	3R 860707
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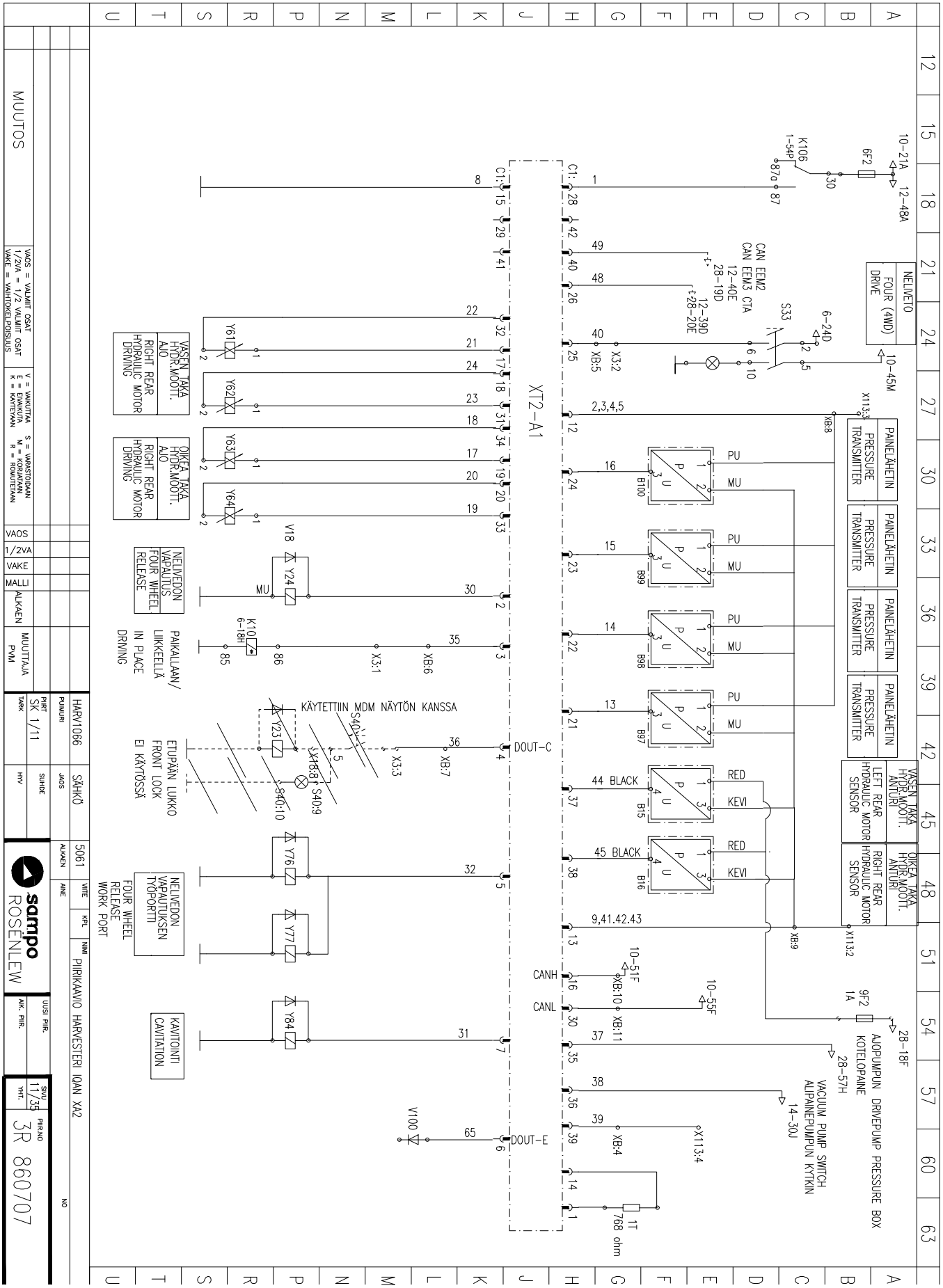

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VAKE	VAKE = VAIHTOKELPOISUUS	K = KÄYTETÄÄN	R = ROMUTETAAN

MALLI			
ALKAEN			
MUUTTAJA PVM			

PIIRT	HARV1066	SÄHKÖ	5061
TARK	SK 1/11	JAOS	SUHDE
HYV			

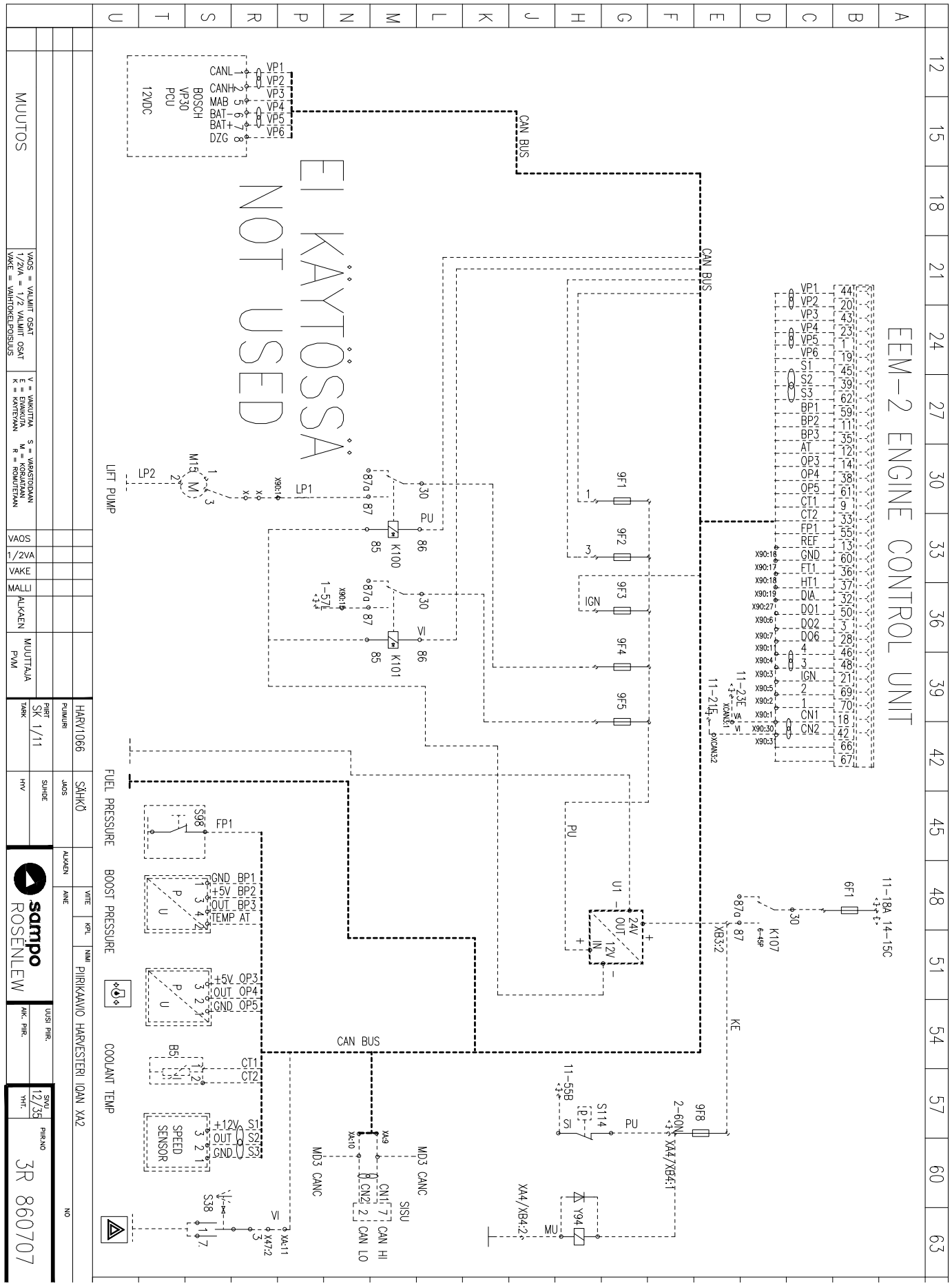
PUIMURI
ALKAEN
VITE
KPL
NIMI
PIIRIKAAVIO HARVESTERI IQAN XA2

sampo ROSENLEW

AIK. PIIR.
UUSI PIIR.

SIVU 11/33
YHT.
PIIR.NO 3R 86070

NO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BOOST PRESSURE
COOLANT TEMP
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HARV1066
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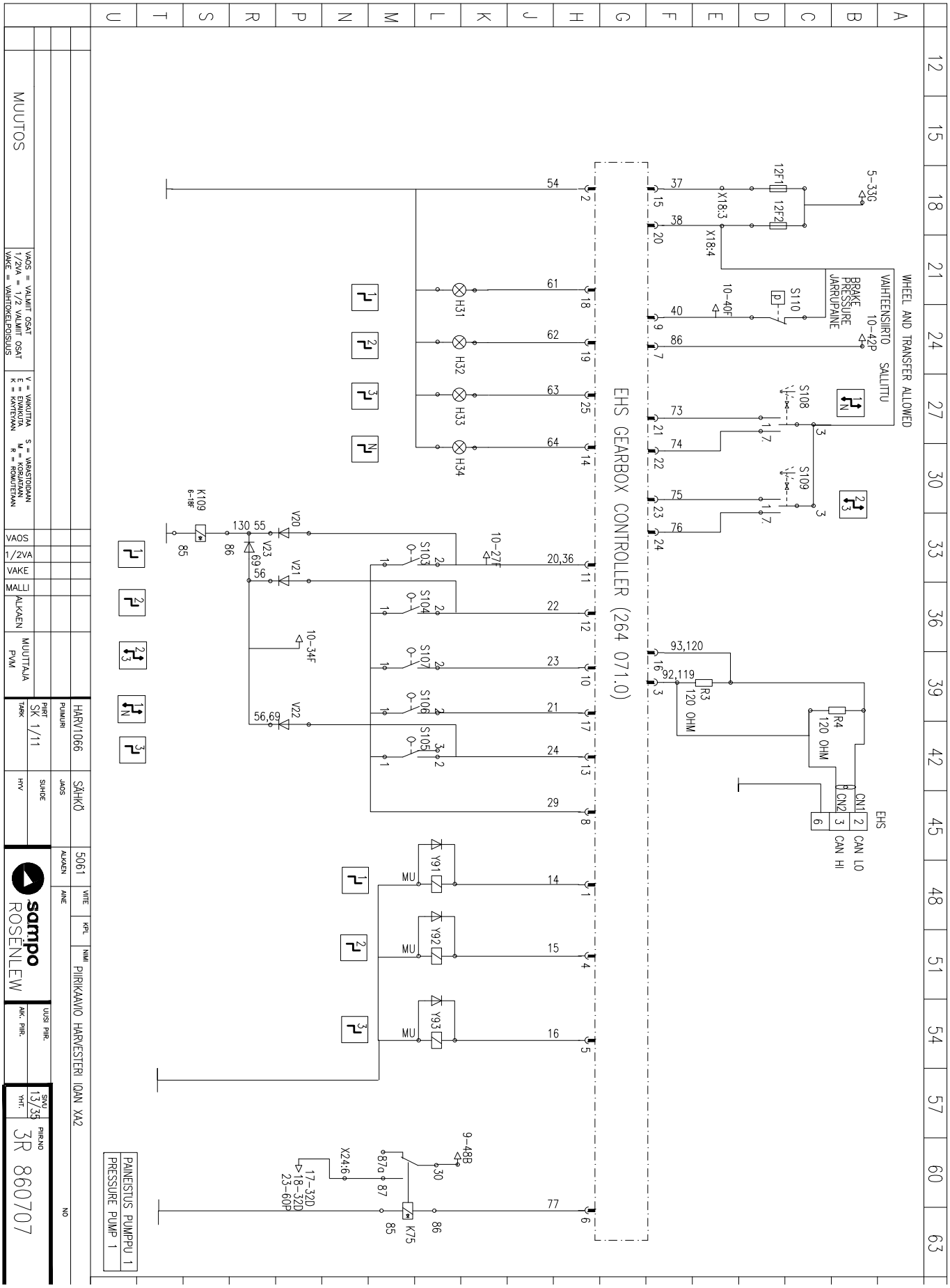
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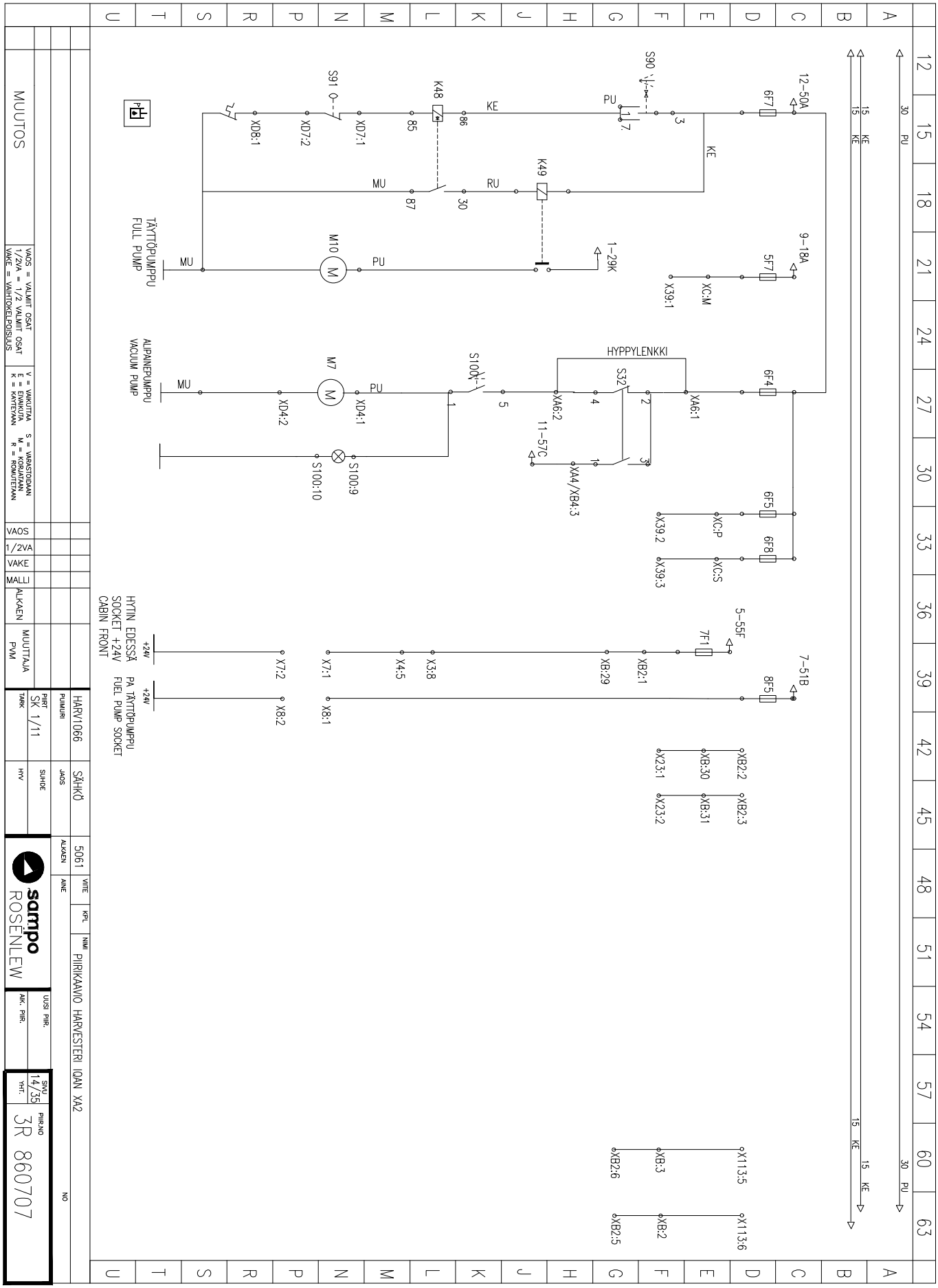
MUUTOS
PIIRIKAAVIO HARVESTERI IQAN XA2
SAMPO ROSENLEW
3R 86707



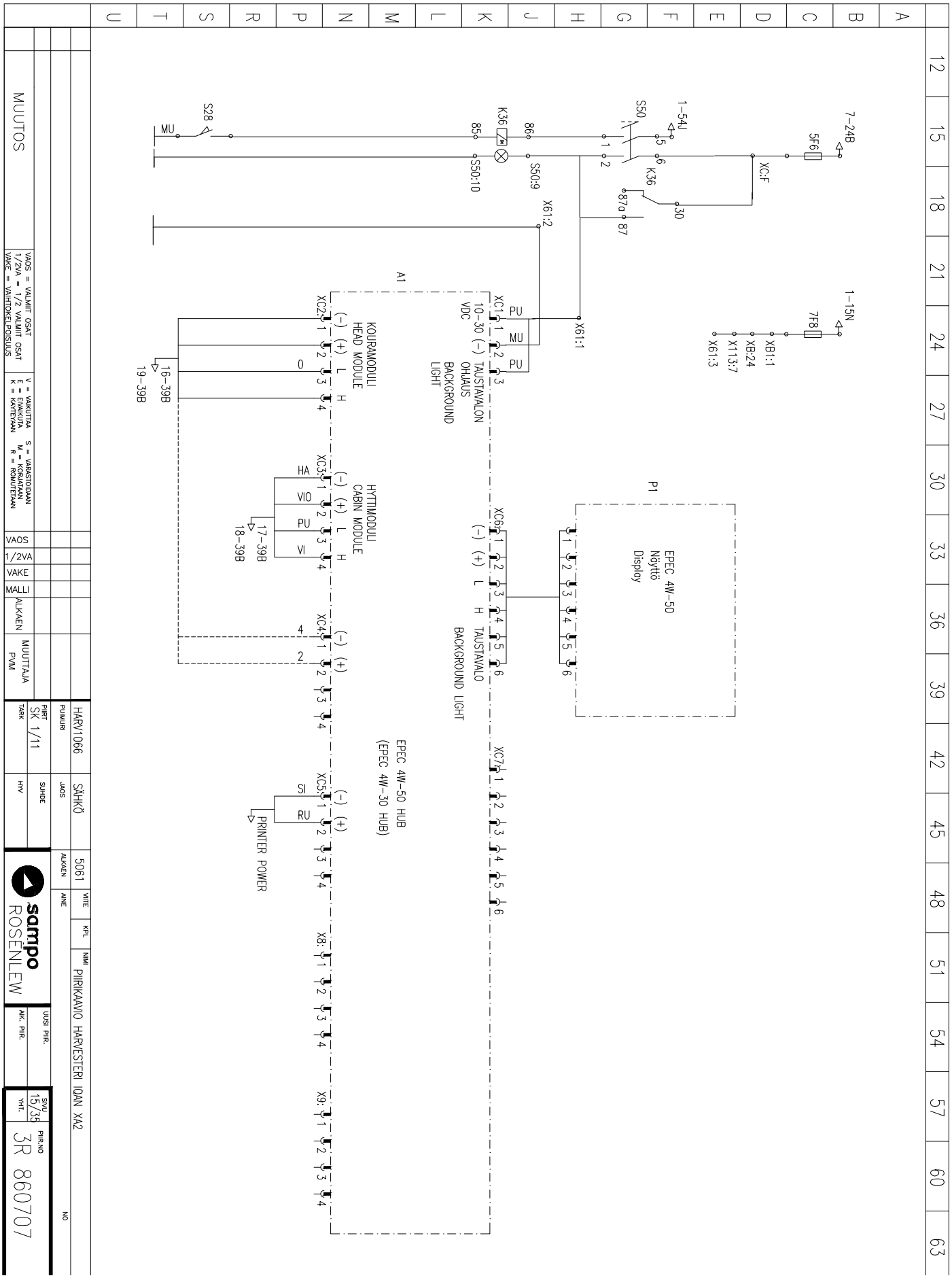
MUUTOS	MUUTTAJA PVM	ALKAEN	MALLI	VAKE	1/2VA	VAOS
VAOS = VALMIIT OSAT 1/2VA = 1/2 VALMIIT OSAT VAKE = VAIHTOKELPOISUUS						
V = VANKUTTAA E = EIVAIKUTA K = KÄYTETYÄÄN	S = VARASTOIDAAN M = KORJATTAAN R = ROMUTETAAN					

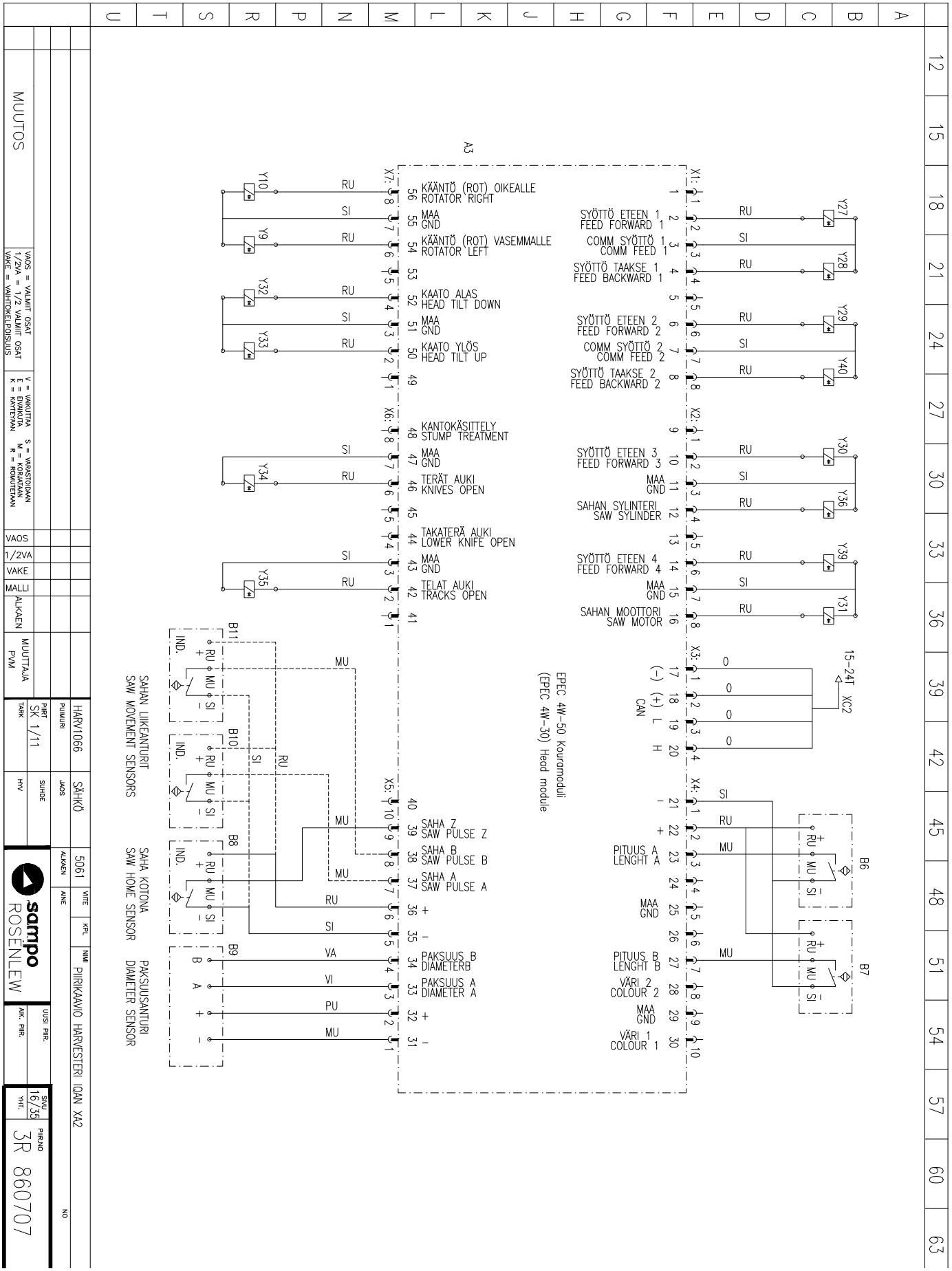
PIIRT	HARV1066	SÄHKÖ	5061	VIITE	KPL	NIMI
TARK	PUIMURI	JAOS	ALKAEN	AINE		PIIRIKAAVIO HARVESTERI IQAN XA2
SK 1/11		SUHDE				
HYV						

sampo ROSENLEW

UUSI PIIR.	SIVU	PIIR.NO
AIK. PIIR.	14/35	3R 860707
	YHT.	

NO


MUUTOS
VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS
V = VANKUITTAA
E = EIMIKUTA.
K = KÄYTETÄÄN
S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN
VAOS
1/2VA
VAKE
MALLI
ALKAEN
MUUTTAJA PVM
HARV1066
SÄHKÖ
5061
PIIRT SK 1/11
SUHDE
PIIRIKAAVIO HARVESTERI IQAN XA2
NO
SIVU 15/35
PIIR.NO 3R 860707
S28
MU
K36
85
86
S50:10
S50:9
S50
1-54U
7-24B
5F6
XC:F
87a
87
30
X61:2
X61:1
1-15N
7F8
XB1:1
XB:24
X11:3:7
X61:3
A1
KOURAMODULI
HEAD MODULE
XC2:
(-) (+) L H
16-39B
19-39B
XC1:
10-30 VDC
PU
MU
PU
TAUSTAVALON OHJAUS
BACKGROUND LIGHT
P1
EPEC 4W-50
Näyttö
Display
XC6:
(-) (+) L H
TAUSTAVALO
BACKGROUND LIGHT
HYTTIMODULI
CABIN MODULE
XC3:
HA
VIO
PU
VI
17-39B
18-39B
XC4:
4
2
EPEC 4W-50 HUB
(EPEC 4W-30 HUB)
XC7:
XC5:
SI
RU
PRINTER POWER
X8:
X9:



MUUTOS

VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS

V = VAIKUTTAA
E = EIVAIKUTA
K = KÄYTETÄÄN

S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN

VAOS	
1/2VA	
VAKE	
MALLI	
ALKAEN	
MUUTTAJA PVM	

PIIRT: SK 1/11
TARK:
HYV:
SUHDE
JAOS
PUMURI
ALKAEN

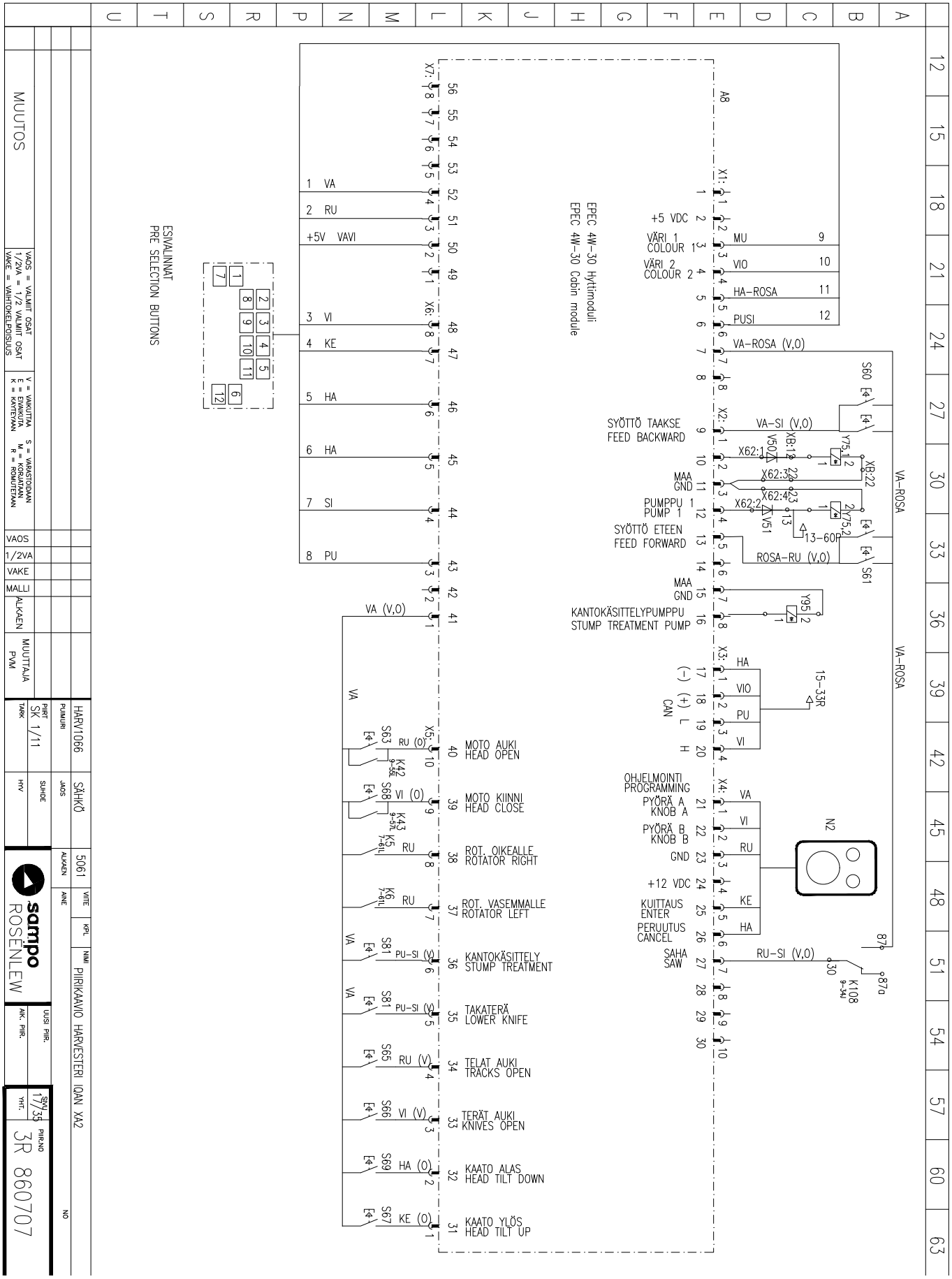
HARV1066 | SÄHKÖ | 5061 | VRTE | KPL | NIMI | PIIRIKAAVIO HARVESTERI IQAN XA2
AINE
NO

sampo ROSENLEW

UUSI PIIR.
AIK. PIIR.

SIVU 16/33
YHT.

PIIR.NO 3R 86070



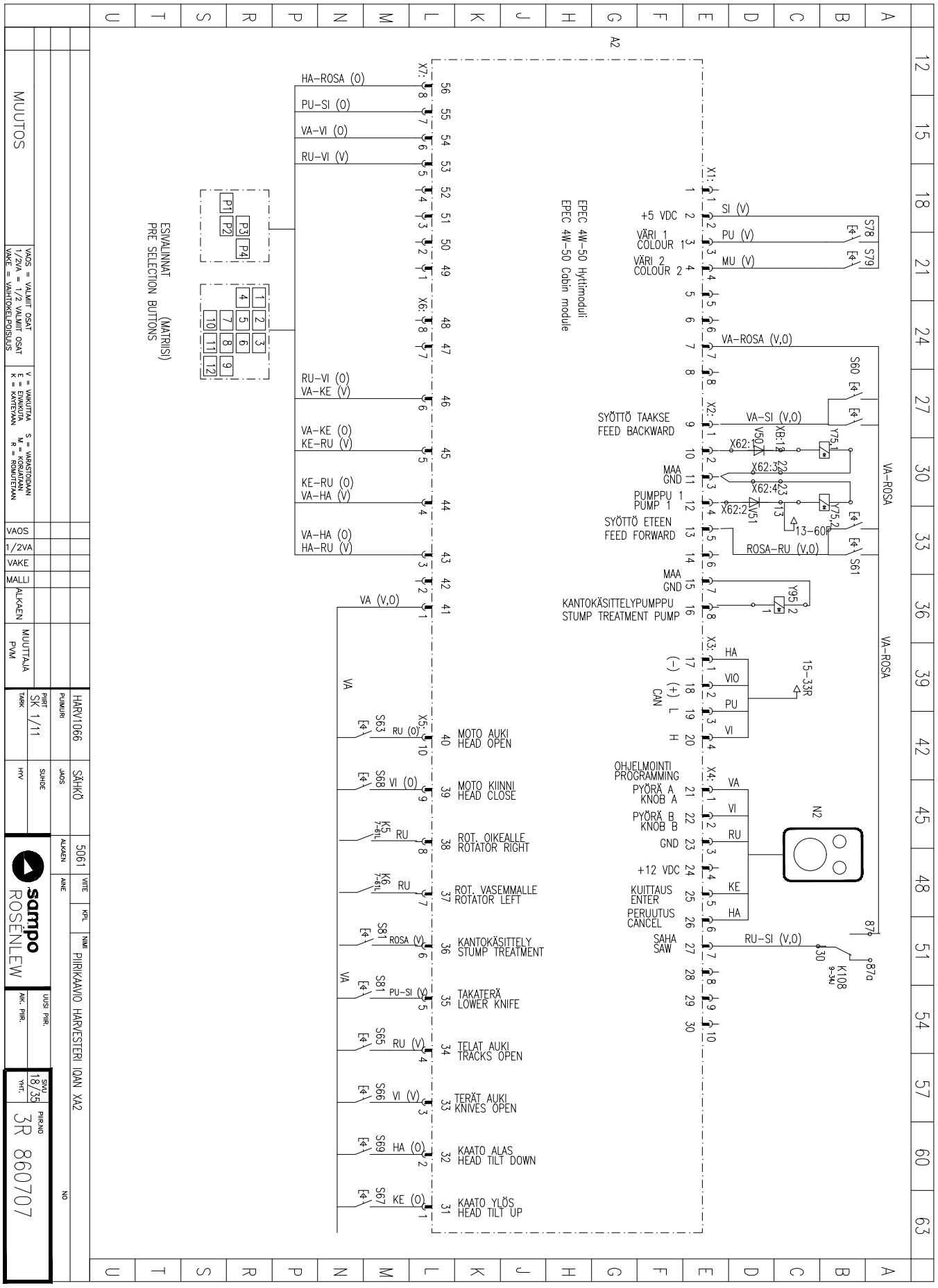
MUUTOS

VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS

V = VAIKUTTAA
E = ENVAIKUTA
K = KÄYTETÄÄN

S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN

| | | |



MUUTOS

VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS

V = VAIKUTTAA
E = EIVAIKUTA
K = KÄYTETÄÄN

S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN

VAOS			
1/2VA			
VAKE			
MALLI			
ALKAEN			
MUUTTAJA PVM			

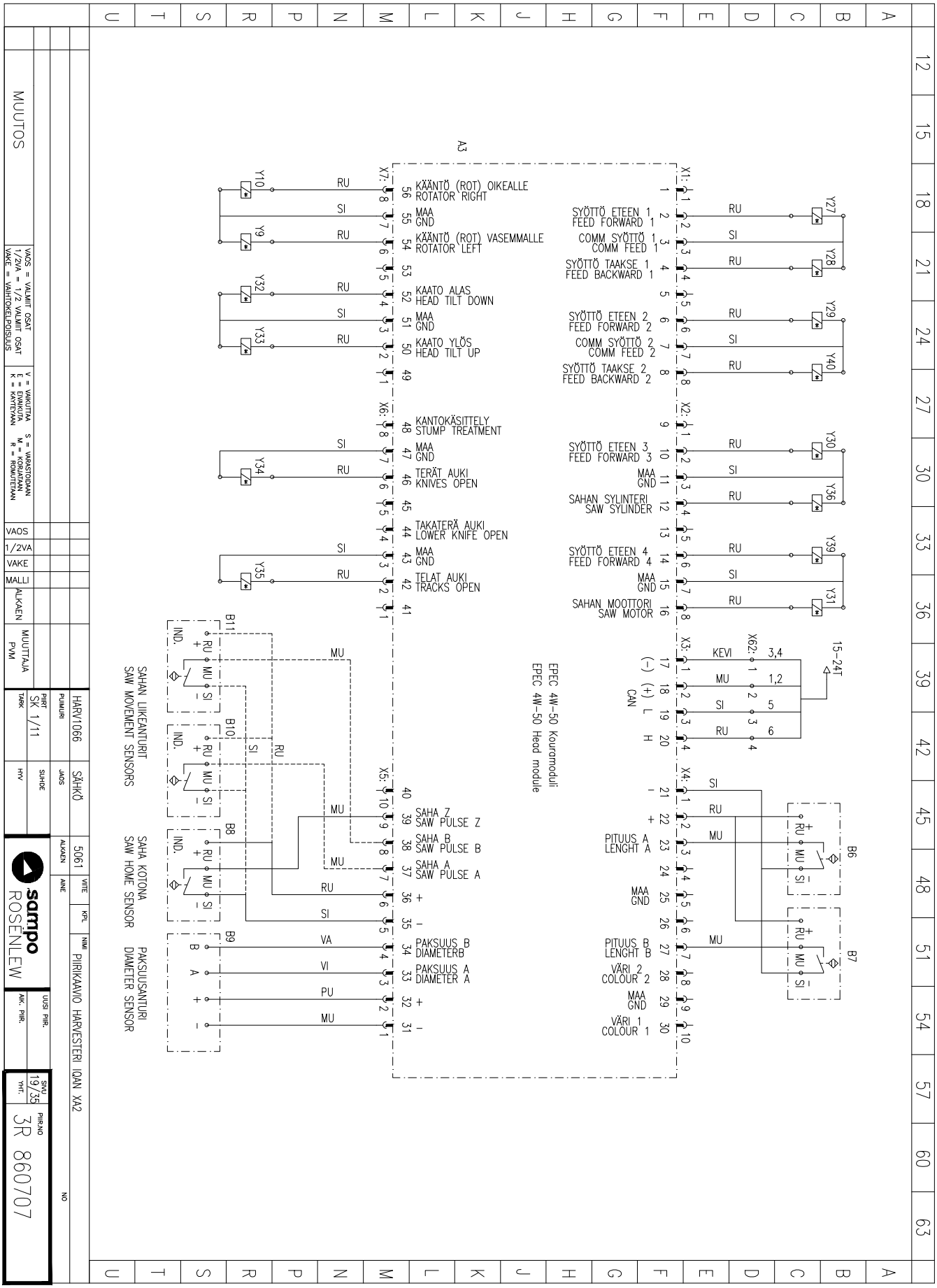
HARV1066	SÄHKÖ	5061	VIITE	KPL	NIMI	PIIRIKAAVIO HARVESTERI IQAN XA2
PIRT SK 1/11 TARK.	PUIMURI	JAOS	SUHDE	ALKAEN	AINE	UUSI PIIR.
HYV						AIK. PIIR.

sampo ROSENLEW

SIVU 18/35 YHT.

PIIR.NO 3R 860707

NO



MUUTOS

VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS

V = VAIHTETTAVA
E = EVÄKÄYTTÖ
K = KÄYTETÄÄN

S = VARASTOIDAAN
M = MYYNTIIN
R = ROMUTETAAN

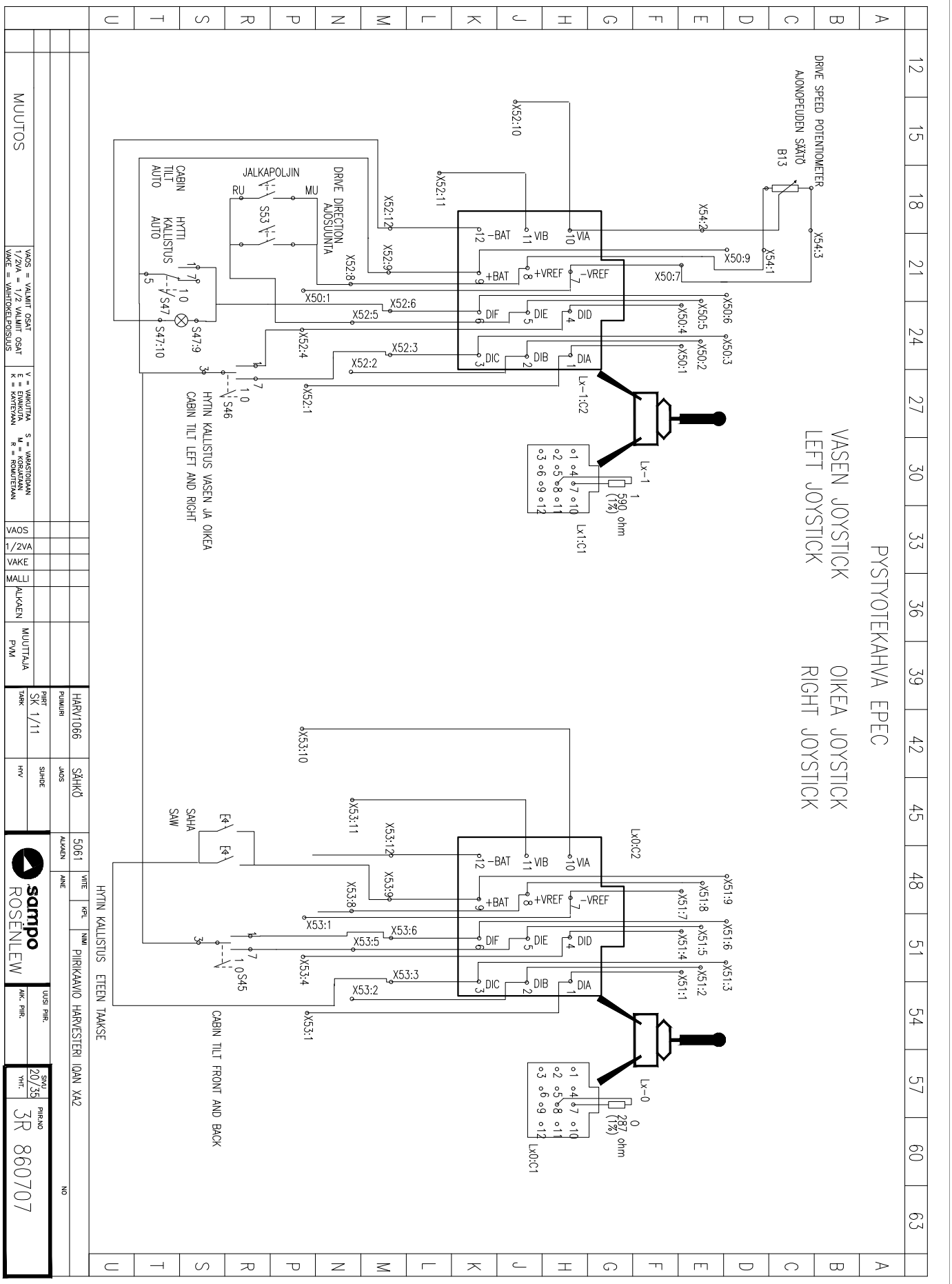
	MUUTTAJA	PVM
VAOS		
1/2VA		
VAKE		
MALLI		
ALKAEN		

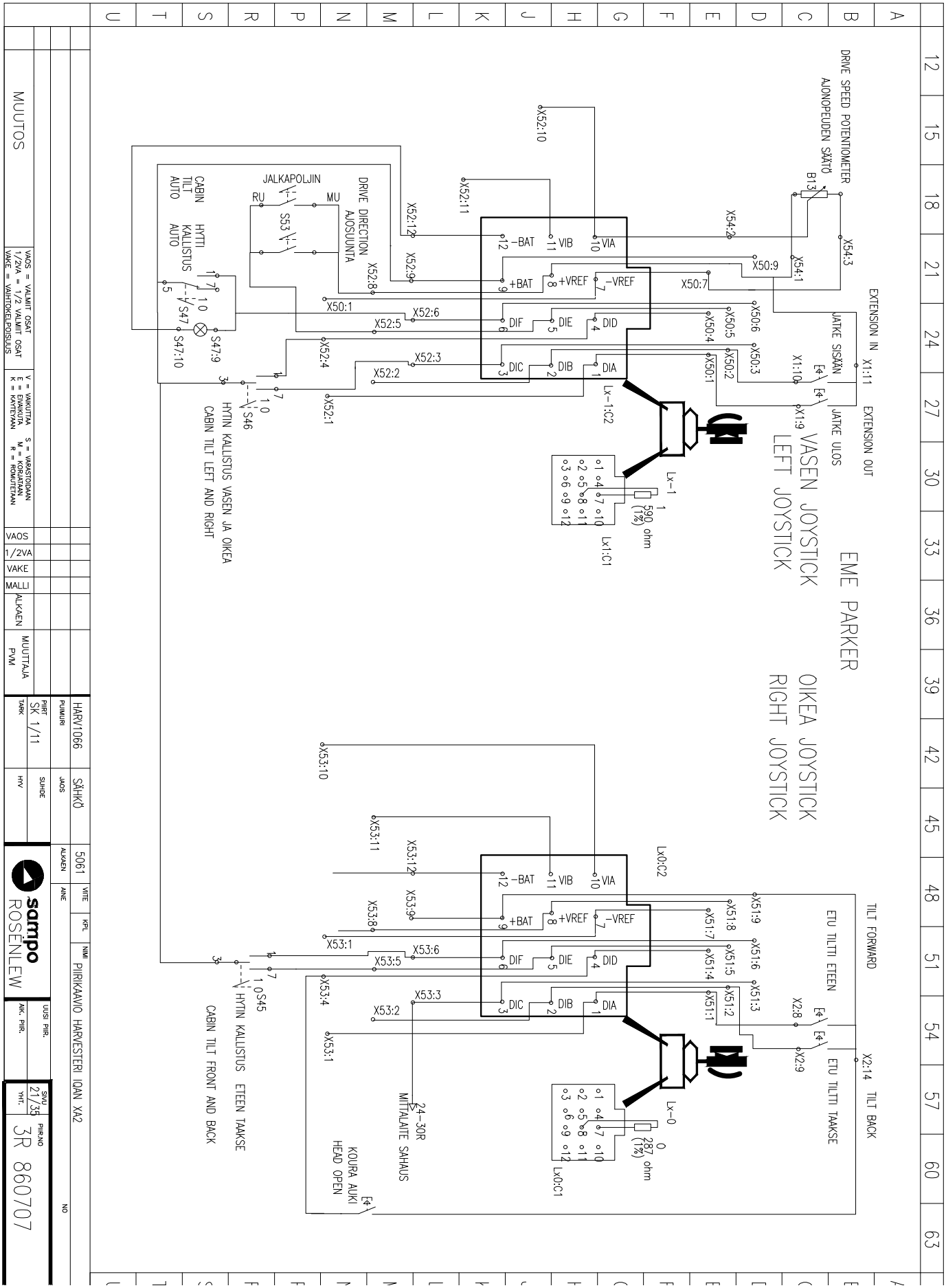
PIIRT	HARV1066
TARK	SK 1/11
HYV	
PUIMURI	SÄHKÖ
JAOS	
ALKAEN	5061
AINE	
VIITE	
KPL	
NIMI	PIIRIKAAVIO HARVESTERI IQAN XA2
AIK. PIIR.	UUSI PIIR.

sampo ROSENLEW

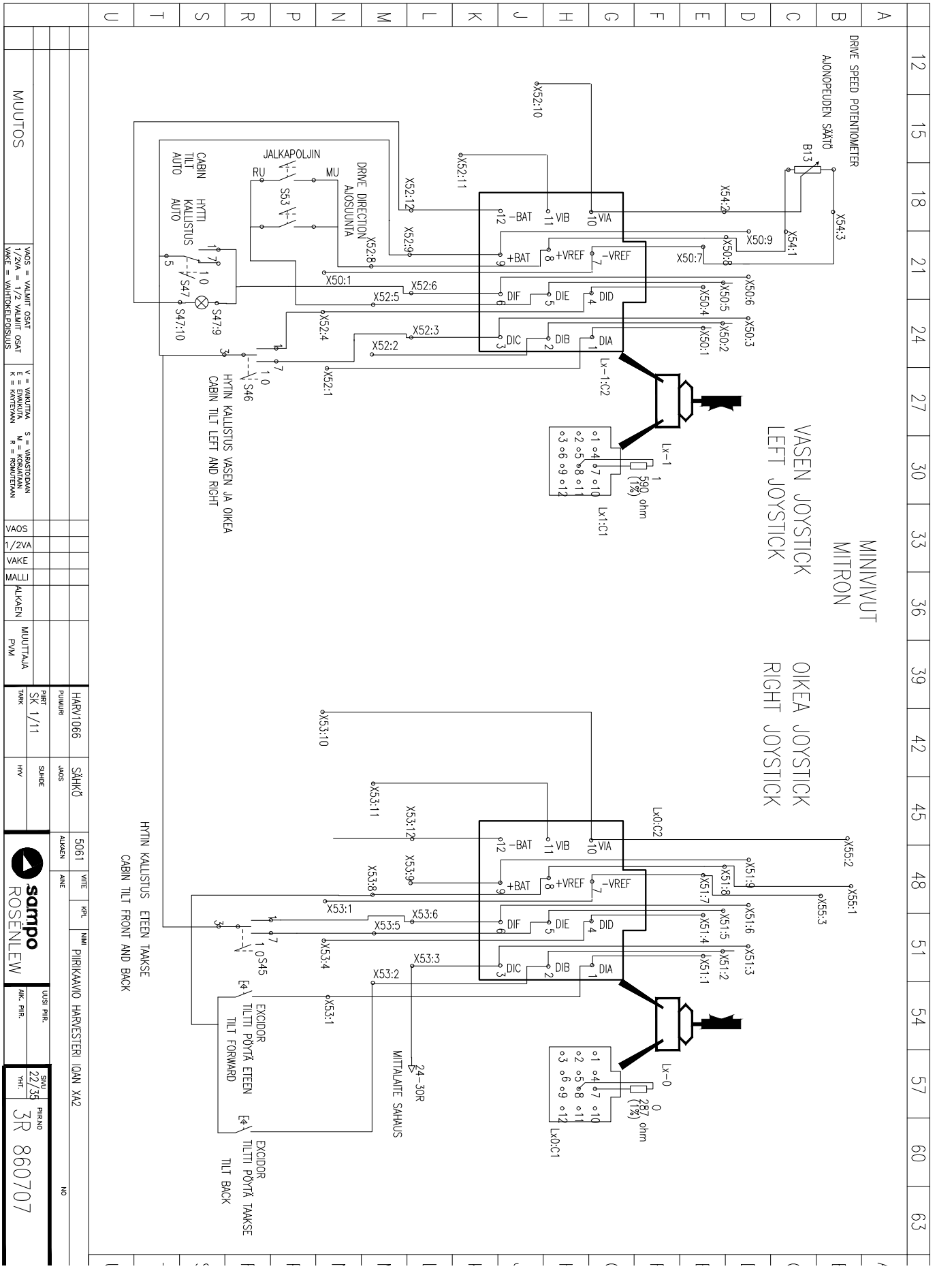
SIVU 19/35
YHT.
PIIR.NO 3R 86070

NO


PYSTYOTEKAHVA EPEC
VASEN JOYSTICK
LEFT JOYSTICK
OIKEA JOYSTICK
RIGHT JOYSTICK
DRIVE SPEED POTENTIOMETER
AJONOPEUDEN SÄÄTÖ
B13
JALKAPOLJIN
DRIVE DIRECTION
AJOSUUNTA
CABIN TILT AUTO
HYTTI KALLISTUS AUTO
S53
S47
S46
S45
HYTIN KALLISTUS VASEN JA OIKEA
CABIN TILT LEFT AND RIGHT
HYTIN KALLISTUS ETEEN TAAKSE
CABIN TILT FRONT AND BACK
SAHA
SAW
Lx-1
Lx-0
590 ohm (1%)
287 ohm (1%)
PIRIKAAVIO HARVESTERI IQAN XA2
HARV1066
SÄHKÖ
5061
PIIRT. TARK. SK 1/11
SIVU 20/35
PIIR.NO 3R 860707
NO
MUUTOS
VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAHTOKELPOISUUS
V = VAIKUTTAA
E = EIVAIKUTA
K = KÄYTETYKSI
S = VARASTOIDAAN
M = KORJATTAAN
R = ROMUTETAAN
VAOS
1/2VA
VAKE
MALLI
ALIKAEN
MUUTTAJA PVM
PUMURI
JAOS
SUHDE
AUKAEN
VIITE
AINE
KPL
NIMI
UUSI PIIR.
ARK. PIIR.


DRIVE SPEED POTENTIOMETER
AJONOPEUDEN SÄÄTÖ
B13
X54:2
X54:3
X54:1
X50:9
X50:7
X52:10
X52:11
X52:12
X52:9
X52:8
JALKAPOLJIN
RU
MU
S53
DRIVE DIRECTION
AJOSUUNTA
CABIN TILT AUTO
HYTTI KALLISTUS AUTO
S47
S47:9
S47:10
X50:1
X52:6
X52:5
X52:4
X52:3
X52:2
X52:1
-BAT
VIB
VIA
+BAT
+VREF
-VREF
DIF
DIE
DID
DIC
DIB
DIA
X50:6
X50:5
X50:4
X50:3
X50:2
X50:1
EXTENSION IN
X1:11
JATKE SISÄÄN
X1:10
X1:9
JATKE ULOS
EXTENSION OUT
VASEN JOYSTICK
LEFT JOYSTICK
Lx-1:C2
Lx-1
590 ohm (1%)
Lx1:C1
HYTIN KALLISTUS VASEN JA OIKEA
CABIN TILT LEFT AND RIGHT
S46
EME PARKER
OIKEA JOYSTICK
RIGHT JOYSTICK
Lx0:C2
X53:10
X53:11
X53:12
X53:9
X53:8
X53:1
X53:6
X53:5
X53:4
X53:3
X53:2
X53:1
X51:9
X51:8
X51:7
X51:6
X51:5
X51:4
X51:3
X51:2
X51:1
TILT FORWARD
ETU TILTTI ETEEN
X2:8
X2:9
ETU TILTTI TAAKSE
X2:14
TILT BACK
Lx-0
287 ohm (1%)
Lx0:C1
HYTIN KALLISTUS ETEEN TAAKSE
CABIN TILT FRONT AND BACK
S45
24-30R
MITTALAITE SAHAUS
KOURA AUKI
HEAD OPEN

| | | |



MUUTOS

VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS

V = VAIKUTTAA
E = EI VAIKUTTAA
K = KÄYTETÄÄN

S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN

VAOS					
1/2VA					
VAKE					
MALLI					
ALKAEN					
MUUTTAJA PVM					

PIIRT SK 1/11	HARV1066	SÄHKÖ	5061	VIITE	PIIRIKAAVIO HARVESTERI IQAN XA2
TARK	PUIMURI	JAOS	ALKAEN	AINE	KPL
HYV		SUHDE			NIMI

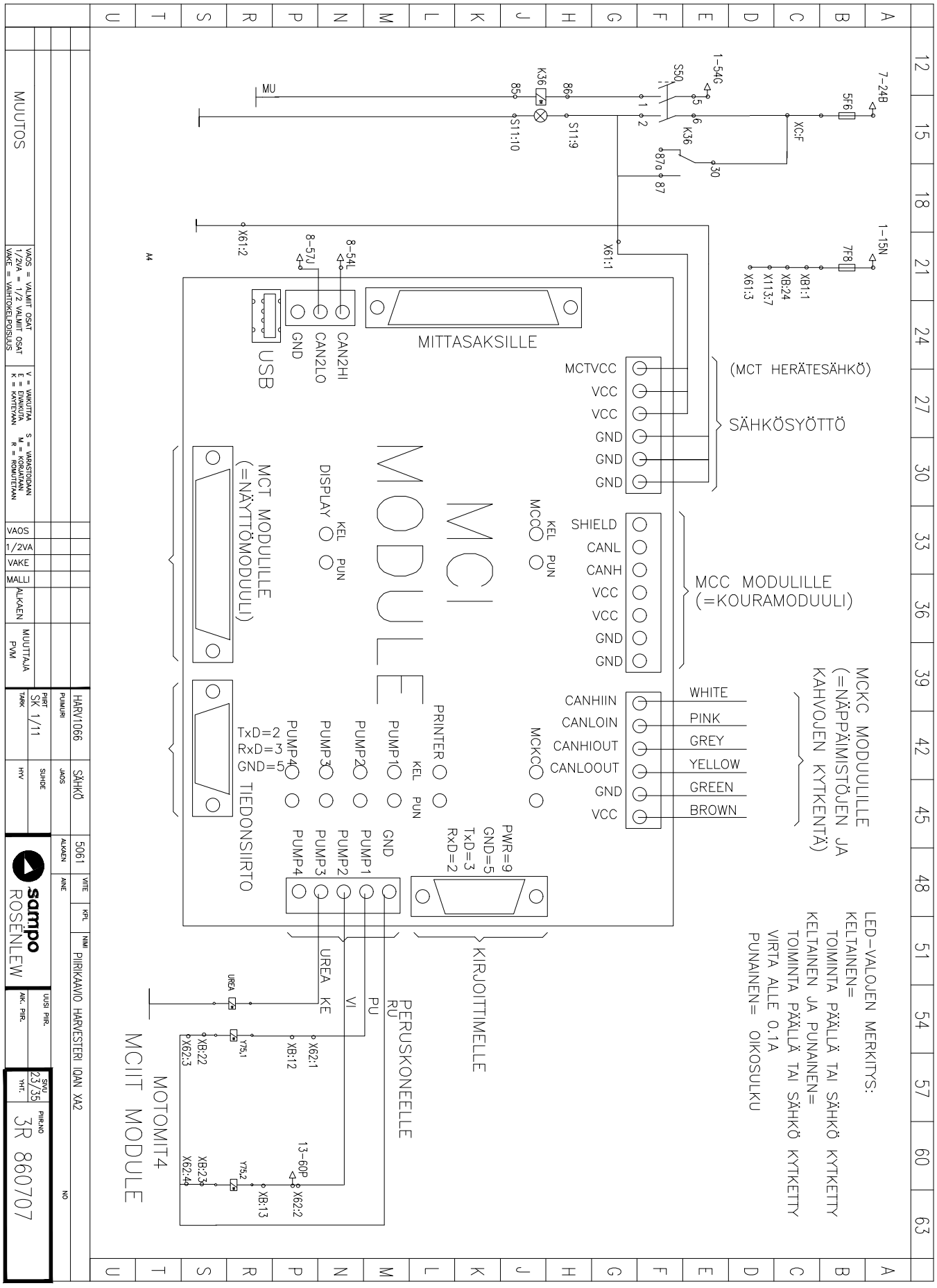
sampo ROSENLEW

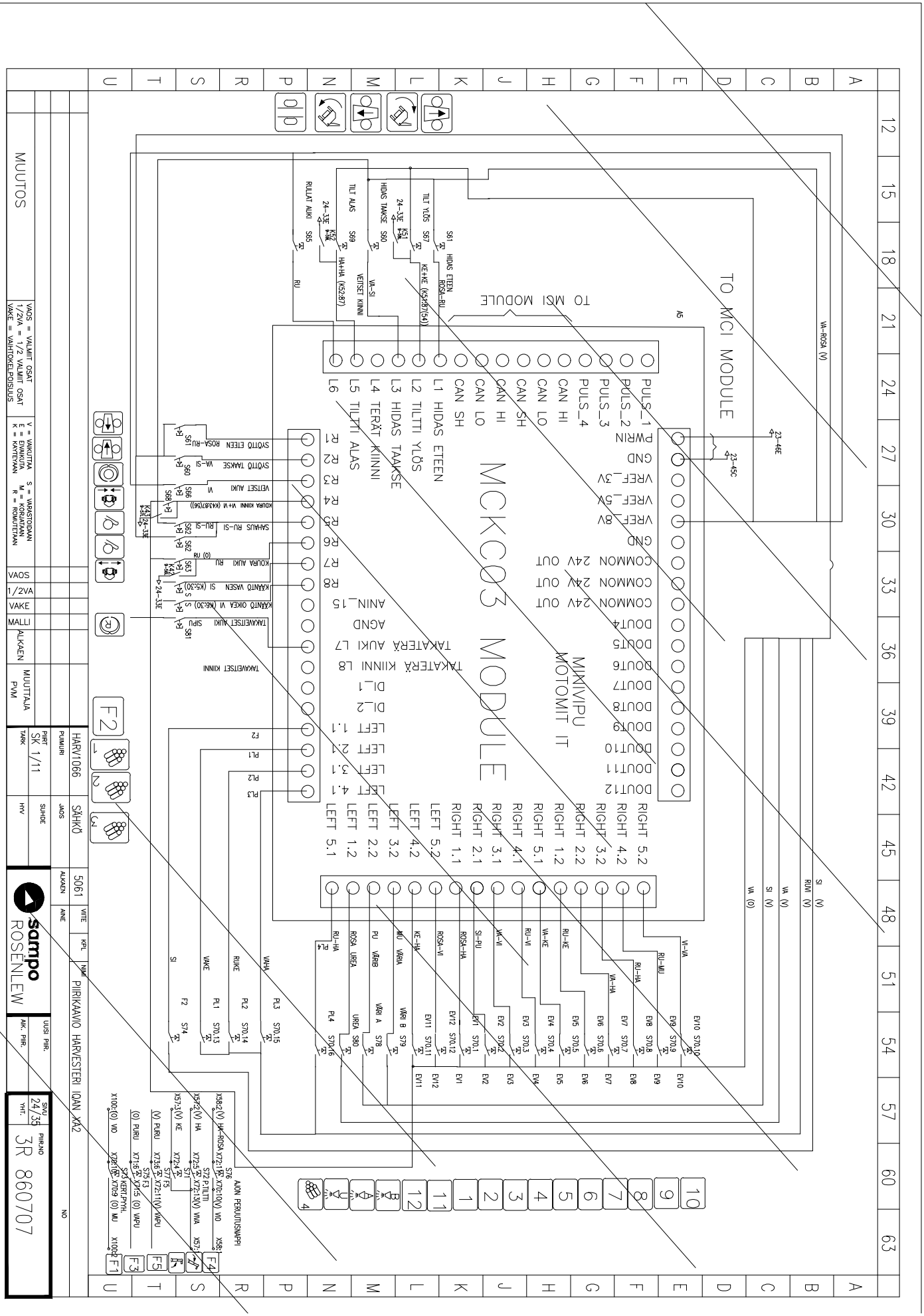
UUSI PIIR.
AIK. PIIR.

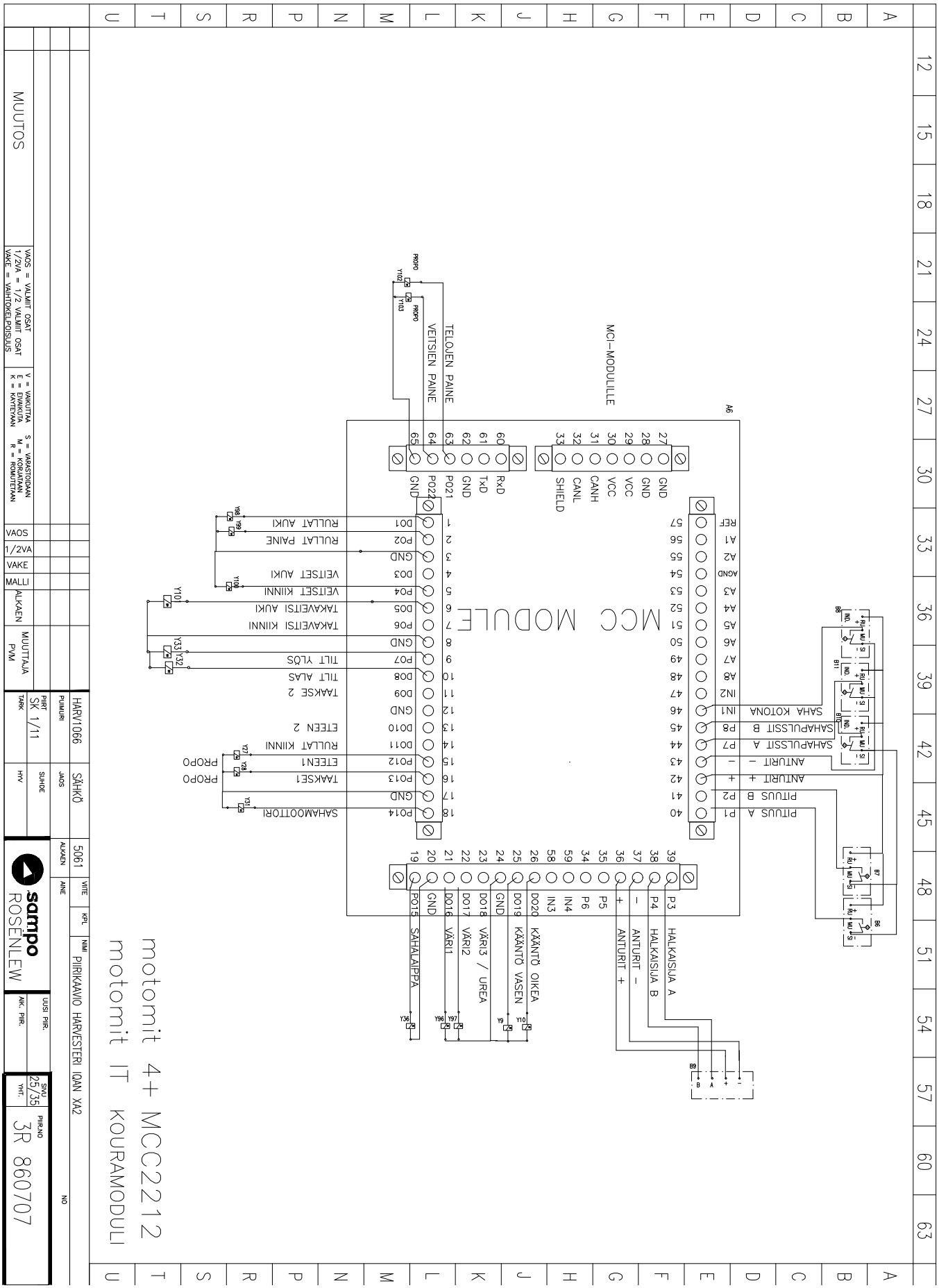
SIVU 22/35
YHT.

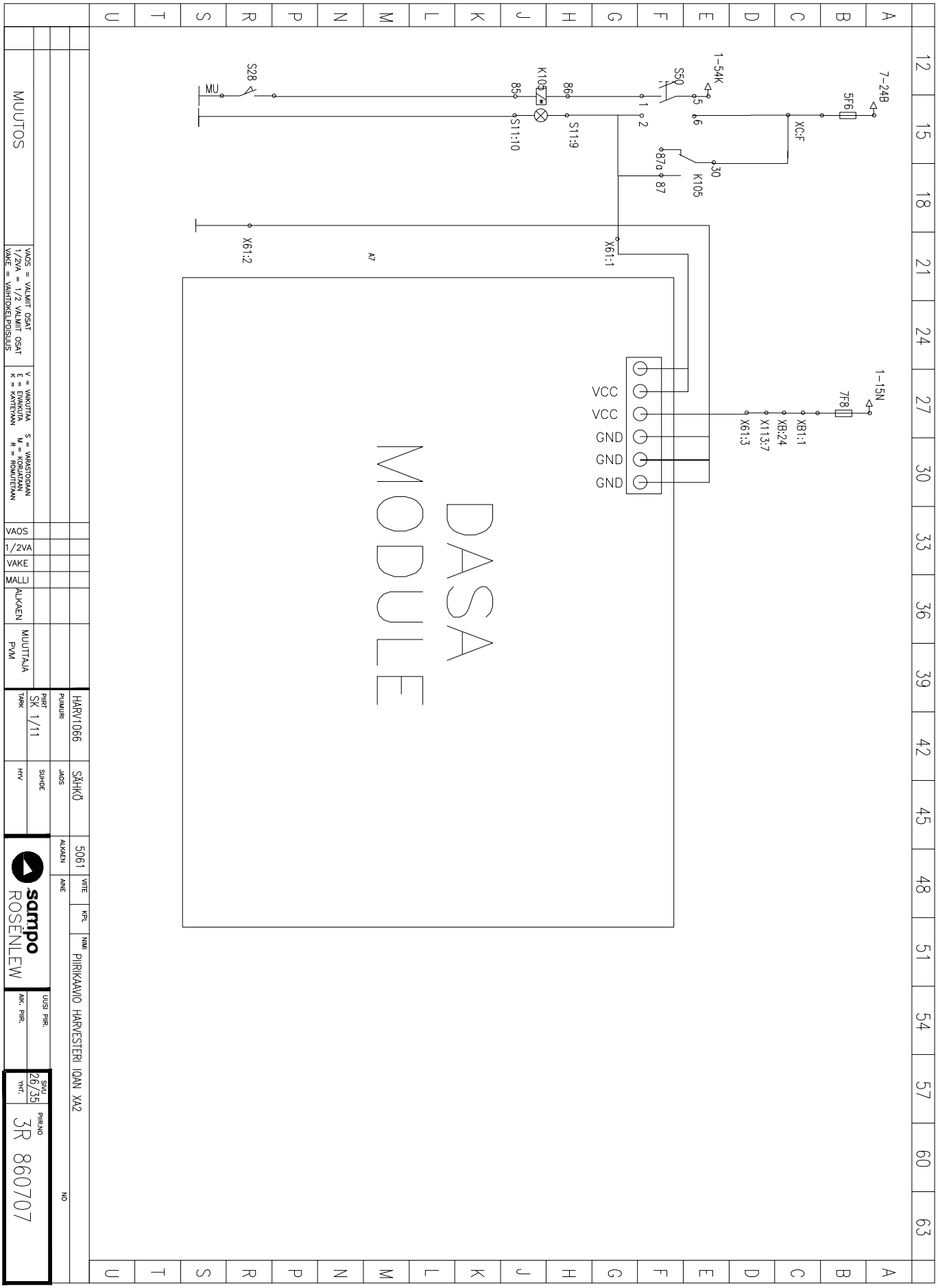
PIIR.NO 3R 86707

NO


MUUTOS
VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS
V = VAIKUTTAA
E = EIVAIKUTA
K = KAYTETYAN
S = VARASTOIDAAN
M = KORJATTAAN
R = ROMUTETAAN
VAOS
1/2VA
VAKE
MALLI
ALKAEN
MUUTTAJA PVM
HARV1066
SÄHKÖ
5061
PIIRIKAAVIO HARVESTERI IQAN XA2
SAMPO ROSENLEW
SIVU 23/35
PIIRIJNO 3R 860707
MU
S50
K36
S11:9
S11:10
XC:F
7-24B
5F6
1-54G
1-15N
7F8
XB1:1
XB:24
X113:7
X61:3
X61:1
X61:2
8-57J
8-54L
CAN2HI
CAN2LO
GND
USB
MITTASAKSILLE
MCTVCC
VCC
VCC
GND
GND
GND
(MCT HERÄTESÄHKÖ)
SÄHKÖSYÖTTÖ
MCI MODULE
SHIELD
CANL
CANH
VCC
VCC
GND
GND
MCC MODULILLE
(=KOURAMODUULI)
CANHIIN
CANLOIN
CANHIOUT
CANLOOUT
GND
VCC
WHITE
PINK
GREY
YELLOW
GREEN
BROWN
MCKC MODUULILLE
(=NÄPPÄIMISTÖJEN JA
KAHVOJEN KYTKENTÄ)
LED-VALOJEN MERKITYS:
KELTAINEN=
TOIMINTA PÄÄLLÄ TAI SÄHKÖ KYTKETTY
KELTAINEN JA PUNAINEN=
TOIMINTA PÄÄLLÄ TAI SÄHKÖ KYTKETTY
VIRTA ALLE 0.1A
PUNAINEN= OIKOSULKU
MCT MODULILLE
(=NÄYTTÖMODUULI)
DISPLAY
KEL
PUN
MCC
PRINTER
PUMP1
PUMP2
PUMP3
PUMP4
GND
PWR=9
GND=5
TxD=3
RxD=2
TxD=2
RxD=3
GND=5
TIEDONSIIRTO
KIRJOITTIMELLE
PERUSKONEELLE
RU
PU
VI
KE
UREA
MOTOMIT4
MCIIT MODULE
X62:1
XB:12
XB:22
X62:3
Y75.1
13-60P
X62:2
XB:23
X62:4
Y75.2
XB:13


MCKC03 MODULE
TO MCI MODULE
MINIVIPU
MOTOMIT IT
PIIRIKAAVIO HARVESTERI IQAN X42
HARV1066
SÄHKÖ
5061
SAMPO ROSENLEW
MUUTOS
MUUTTAJA
PVM
ALKAEN
MALLI
VAOS
1/2VA
VAKE
PIIRT
TARK
HYV
PIIRNO
3R 860707
SIVU
24/33
YHT.
NO


MCC MODULE
MCI-MODULILLE
TELOJEN PAINE
VETTSIEN PAINE
PROPO
PROPO
RxD
TxD
SHIELD
CANL
CANH
VCC
VCC
GND
GND
GND
PO21
PO22
GND
REF
A1
A2
AGND
A3
A4
A5
A6
A7
A8
IN2
IN1
SAHA KOTONA
SAHAPULSSIT B
SAHAPULSSIT A
ANTURIT –
ANTURIT +
PITUUS B
PITUUS A
RULLAT AUKI
RULLAT PAINE
VEITSET AUKI
VEITSET KIINNI
TAKAVEITSI AUKI
TAKAVEITSI KIINNI
TILT YLÖS
TILT ALAS
TAAKSE 2
ETEEN 2
RULLAT KIINNI
ETEEN1
TAAKSE1
SAHAMOOTTORI
PROPO
PROPO
P3
P4
P5
P6
IN4
IN3
D020
D019
D018
GND
D017
D016
GND
P015
HALKAISIJA A
HALKAISIJA B
ANTURIT –
ANTURIT +
KÄÄNTÖ OIKEA
KÄÄNTÖ VASEN
VÄRI3 / UREA
VÄRI2
VÄRI1
SÄHALAIPPA
motomit 4+ MCC2212
motomit IT KOURAMODULI
MUUTOS
VAOS = VALMIT OSAT
1/2VA = 1/2 VALMIT OSAT
VAKE = VAIHTOKELPOISUUS
V = VAIKUTTAA
E = EIVAIKUTA
K = KÄYTETÄÄN
S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN
VAOS
1/2VA
VAKE
MALLI
ALKAEN
MUUTTAJA
PVM
HARV1066
PUIMURI
SÄHKÖ
JAOS
5061
ALKAEN
PIIRT
SK 1/11
TARK
HRV
SUHDE
VITE
AINE
KPL
NIMI
PIIRIKAAVIO HARVESTERI IQAN XA2
sampo ROSENLEW
UUSI PIIR.
AIK. PIIR.
SIVU
25/35
YHT.
PIIR.NO
3R 860707
NO



MUUTOS

VAOS = VALMIT OSAT
1/2VA = 1/2 VALMIT OSAT
VAKE = VAIHTOKELPOISUUS

V = VAIKUTTAA
E = EIVAIKUTA
K = KAYTETAAN

S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN

VAOS	
1/2VA	
VAKE	
MALLI	
ALKAEN	
MUUTTAJA PVM	

PIIRT.	SK 1/11
TARK.	

PIIRUURI	HARV1066
JAOS	SÄHKÖ
ALKAEN	5061
AINE	
VRTE	
KPL	
NIMI	PIIRIKAAVIO HARVESTERI IQAN XA2

SUHDE	
HYV	

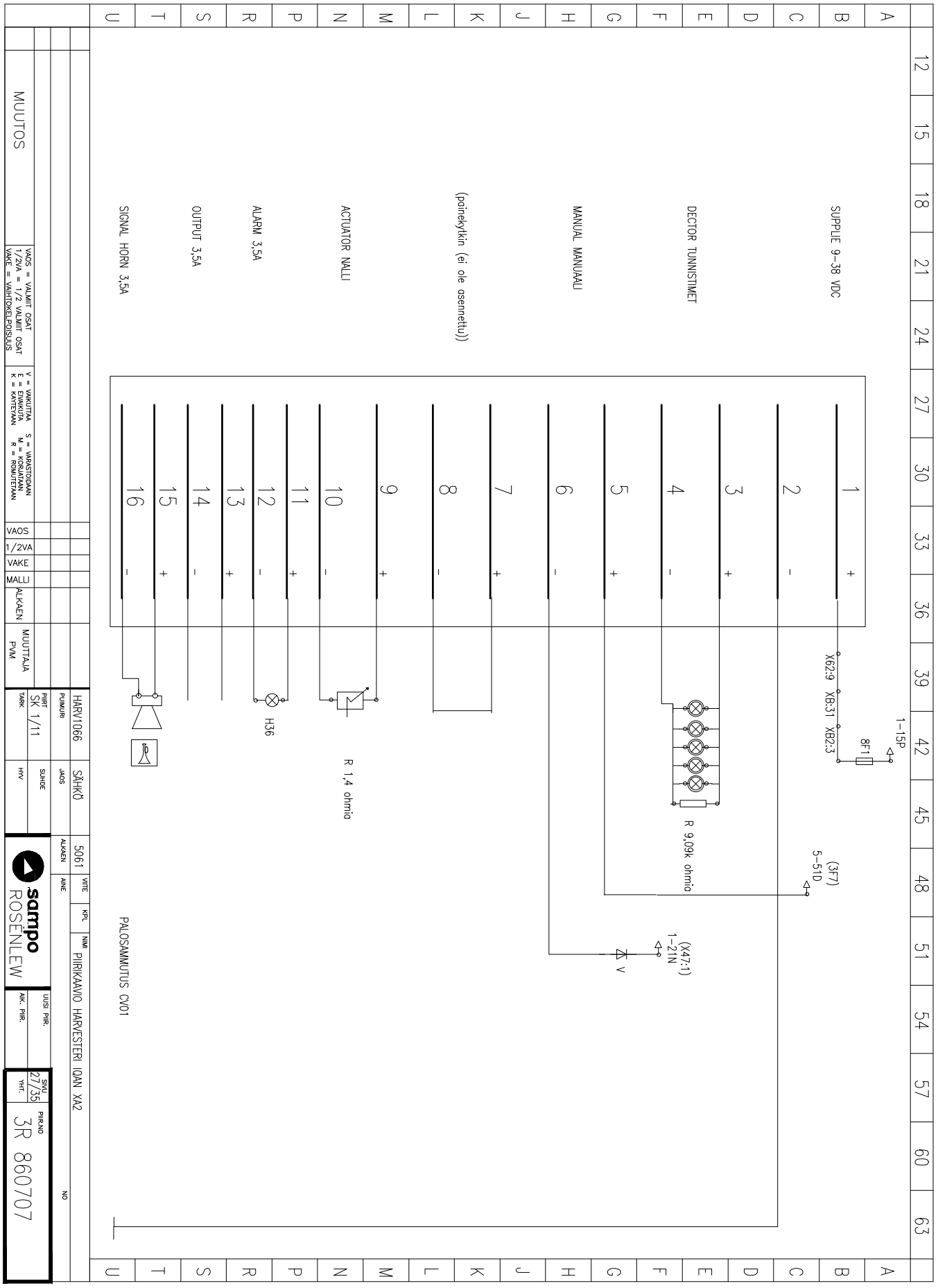
sampo ROSENLEW

AIK. PIIR.	
UUSI PIIR.	

SIVU	26/35
YHT.	

PIIR.NO 3R 860707

NO



MUUTOS

VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAHTOKELPOISUUS

V = VAIKUTTAA
E = EIVAIKUTA
K = KÄYTETÄÄN

S = VARASTOIDAAN
M = KORJAITAAN
R = ROMUTETAAN

VAOS	
1/2VA	
VAKE	
MALLI	
ALKAEN	
MUUTTAJA PVM	

PIIRT. SK 1/11
TARK.

HARV1066
PUIMURI

SÄHKÖ
JAOS

SUHDE
HYV

5061
ALKAEN

VIITE
AINE

KPL

NIMI
PIIRIKAAVIO HARVESTERI IQAN XA2

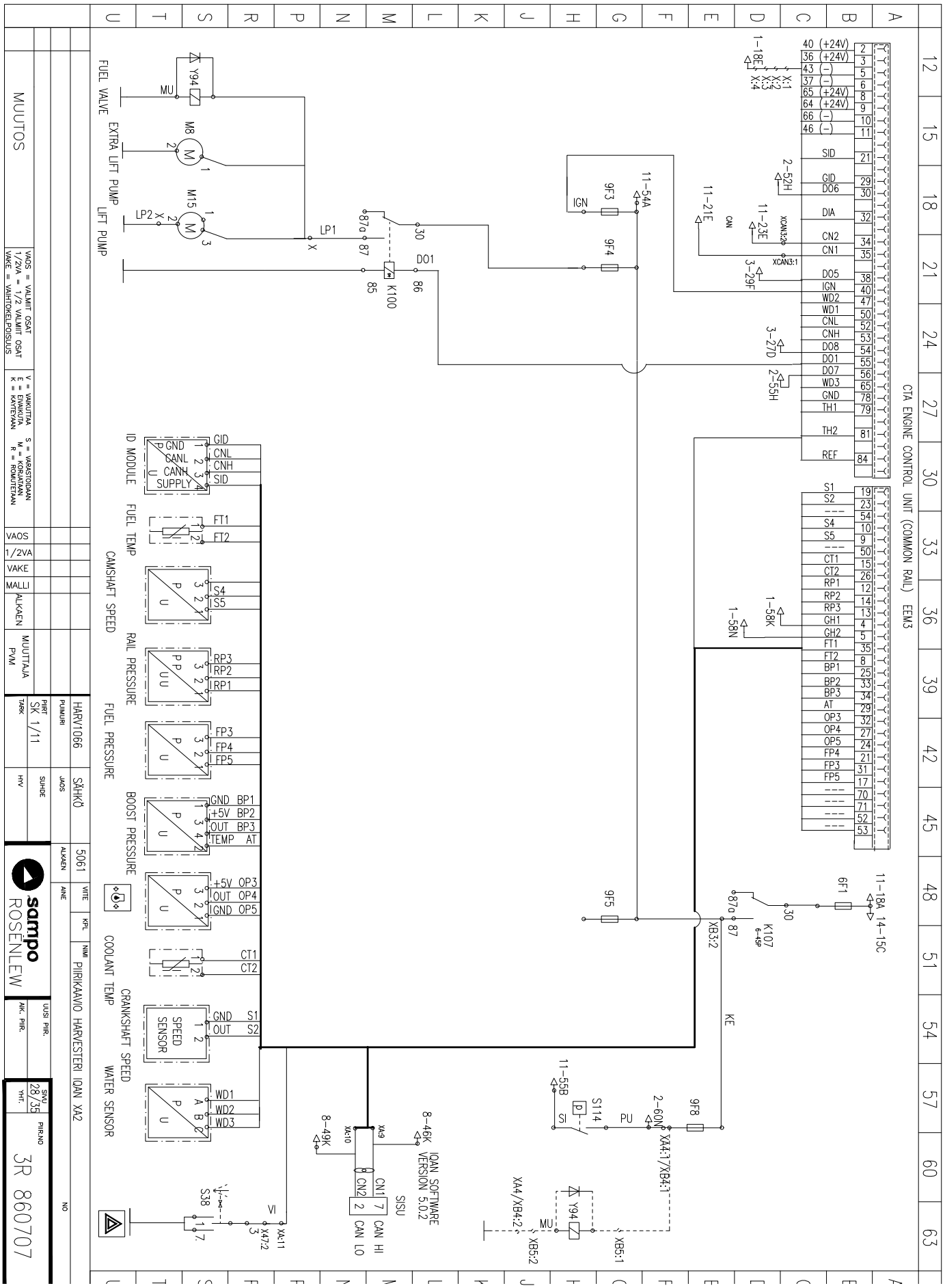
NO

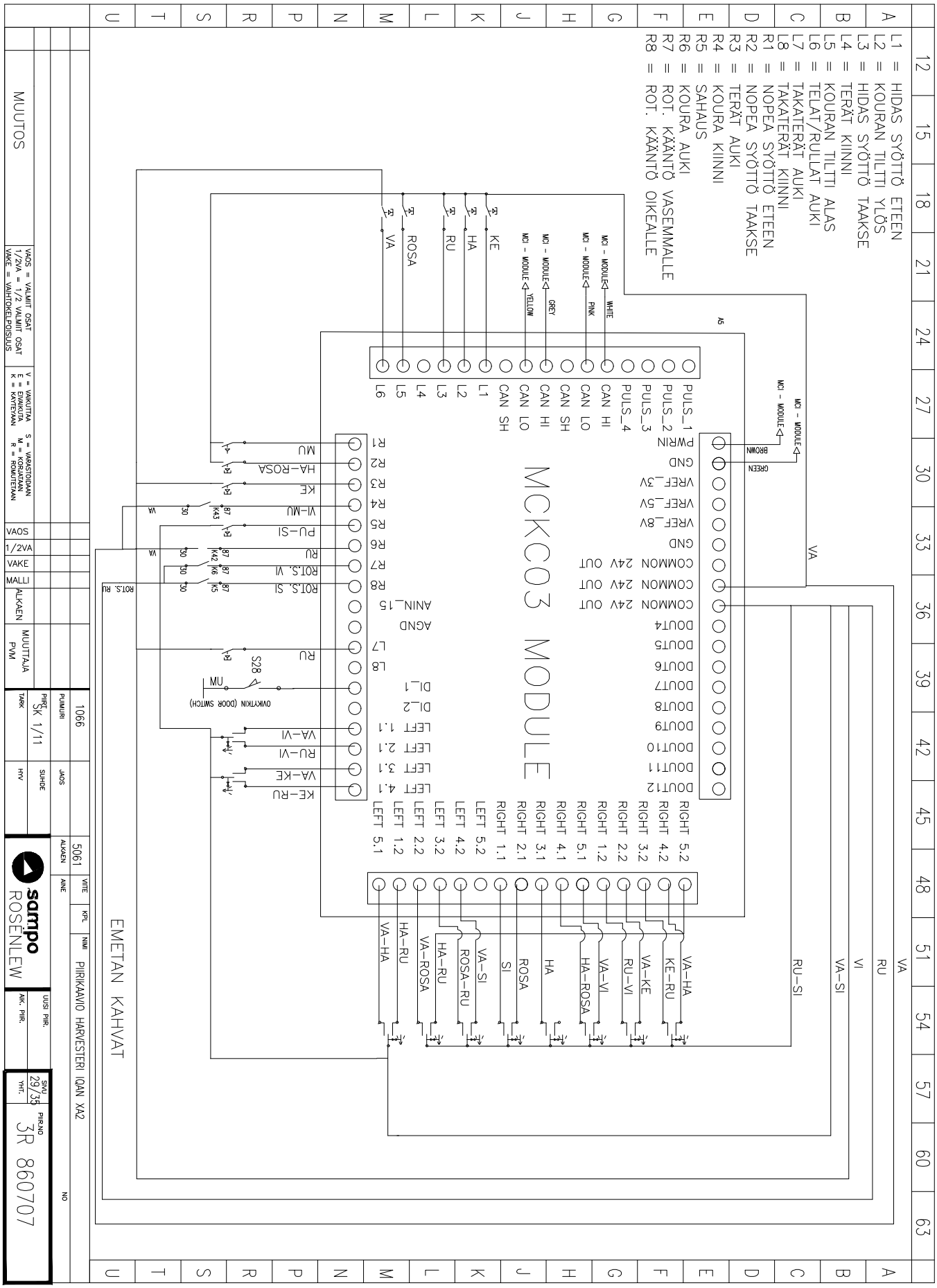
sampo ROSENLEW

ULOSI PIIR.
AIK. PIIR.

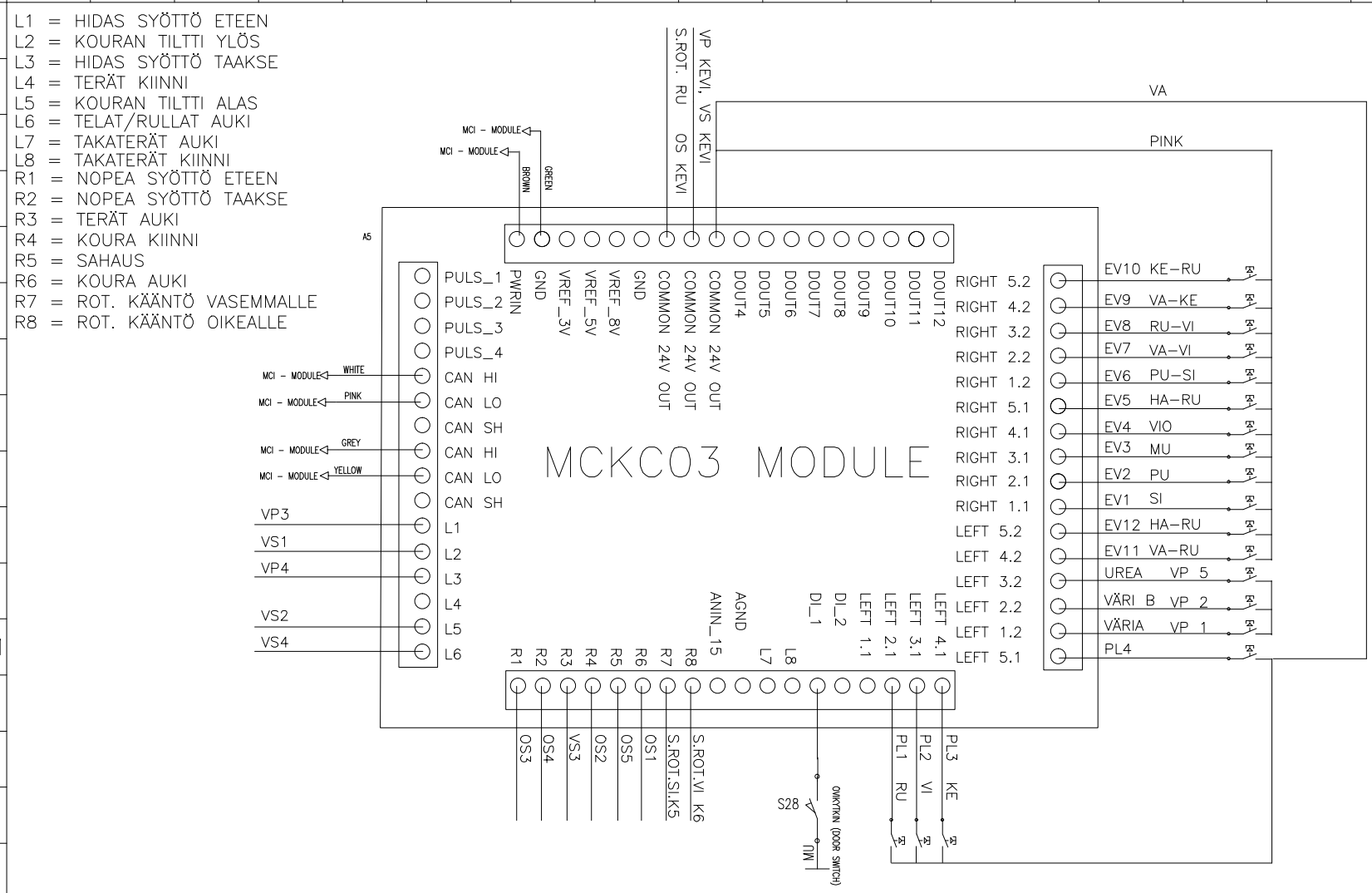
SIVU 27/35
YHT.

PIIR.NO
3R 860707


CTA ENGINE CONTROL UNIT (COMMON RAIL) EEM3
ID MODULE
FUEL TEMP
CAMSHAFT SPEED
RAIL PRESSURE
FUEL PRESSURE
BOOST PRESSURE
COOLANT TEMP
CRANKSHAFT SPEED
WATER SENSOR
FUEL VALVE
EXTRA LIFT PUMP
LIFT PUMP
IQAN SOFTWARE VERSION 5.0.2
SISU CAN HI CAN LO
MUUTOS
PIIRIKAAVIO HARVESTERI IQAN XA2
3R 860707
SÄHKÖ
HARV1066
5061
SUHDE
1/11
NO


L1 = HIDAS SYÖTTÖ ETEEN
L2 = KOURAN TILTTI YLÖS
L3 = HIDAS SYÖTTÖ TAAKSE
L4 = TERÄT KIINNI
L5 = KOURAN TILTTI ALAS
L6 = TELAT/RULLAT AUKI
L7 = TAKATERÄT AUKI
L8 = TAKATERÄT KIINNI
R1 = NOPEA SYÖTTÖ ETEEN
R2 = NOPEA SYÖTTÖ TAAKSE
R3 = TERÄT AUKI
R4 = KOURA KIINNI
R5 = SAHAUS
R6 = KOURA AUKI
R7 = ROT. KÄÄNTÖ VASEMMALLE
R8 = ROT. KÄÄNTÖ OIKEALLE
MCKC03 MODULE
EMETAN KAHVAT
MUUTOS
PIIRIKAAVIO HARVESTERI IQAN XA2
SAMPO ROSENLEW
3R 860707

L1 = HIDAS SYÖTTÖ ETEEN
L2 = KOURAN TILTTI YLÖS
L3 = HIDAS SYÖTTÖ TAAKSE
L4 = TERÄT KIINNI
L5 = KOURAN TILTTI ALAS
L6 = TELAT/RULLAT AUKI
L7 = TAKATERÄT AUKI
L8 = TAKATERÄT KIINNI
R1 = NOPEA SYÖTTÖ ETEEN
R2 = NOPEA SYÖTTÖ TAAKSE
R3 = TERÄT AUKI
R4 = KOURA KIINNI
R5 = SAHAUS
R6 = KOURA AUKI
R7 = ROT. KÄÄNTÖ VASEMMALLE
R8 = ROT. KÄÄNTÖ OIKEALLE



VP= VASEN KAHVA PEUKALO NÄPPÄIMET
VS= VASEN KAHVA SORMI NÄPPÄIMET
OS= OIKEA KAHVA SORMI NÄPPÄIMET
OP (EV)= OIKEA KAHVA PEUKALO NÄPPÄIMET

PYSTYOTEKAHVAT

MCKC03

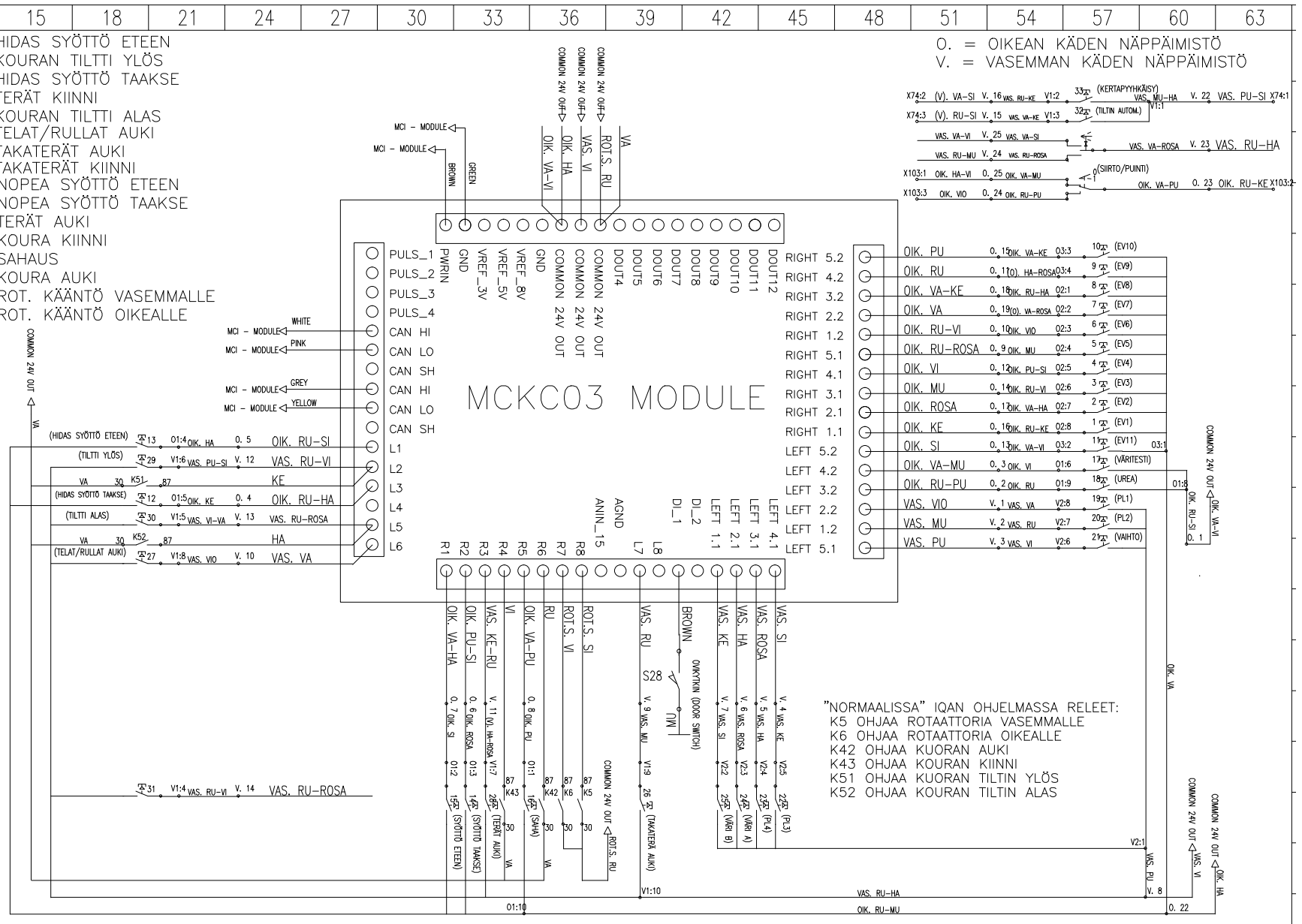
MUUTOS	VAOS = VALMIIT OSAT 1/2VA = 1/2 VALMIIT OSAT VAKE = VAIHTOKELPOISUUS	V = VAIKUTTAA S = VARASTOIDAAN E = EIVAIKUTA M = KORJATAAN K = KAYTEYAAN R = ROMUTETAAN	VAOS	VAZ/1	VAKE	MALLI	ALKAEN	MUUTTAJA PVM

1066		5061	VIITE	KPL	NIMI PIIRIKAAVIO HARVESTERI IQAN XA2
PUIMURI	JAOS	ALKAEN	AINE		NO
PIIRT SK 1/11	SUHDE	sampo ROSENLEW	UUSI PIIR.	SIVU 30/35	PIIR.NO 3R 860707
TARK	HYV		AIK. PIIR.	YHT.	

SAMPO ROSENLEW

L1 = HIDAS SYÖTTÖ ETEEN
L2 = KOURAN TILTTI YLÖS
L3 = HIDAS SYÖTTÖ TAAKSE
L4 = TERÄT KIINNI
L5 = KOURAN TILTTI ALAS
L6 = TELAT/RULLAT AUKI
L7 = TAKATERÄT AUKI
L8 = TAKATERÄT KIINNI
R1 = NOPEA SYÖTTÖ ETEEN
R2 = NOPEA SYÖTTÖ TAAKSE
R3 = TERÄT AUKI
R4 = KOURA KIINNI
R5 = SAHAUS
R6 = KOURA AUKI
R7 = ROT. KÄÄNTÖ VASEMMALLE
R8 = ROT. KÄÄNTÖ OIKEALLE

O. = OIKEAN KÄDEN NÄPPÄIMISTÖ
V. = VASEMMAN KÄDEN NÄPPÄIMISTÖ

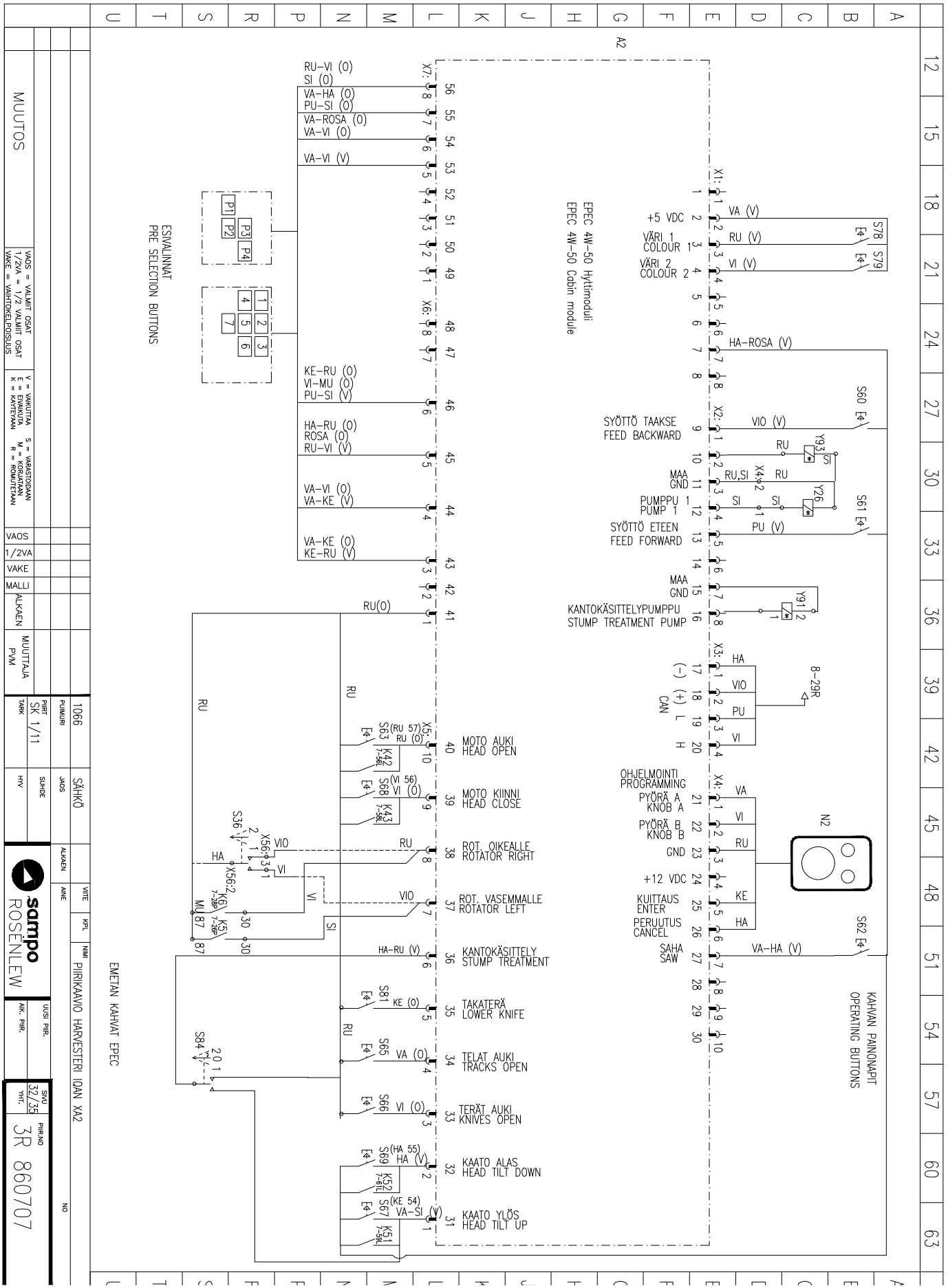


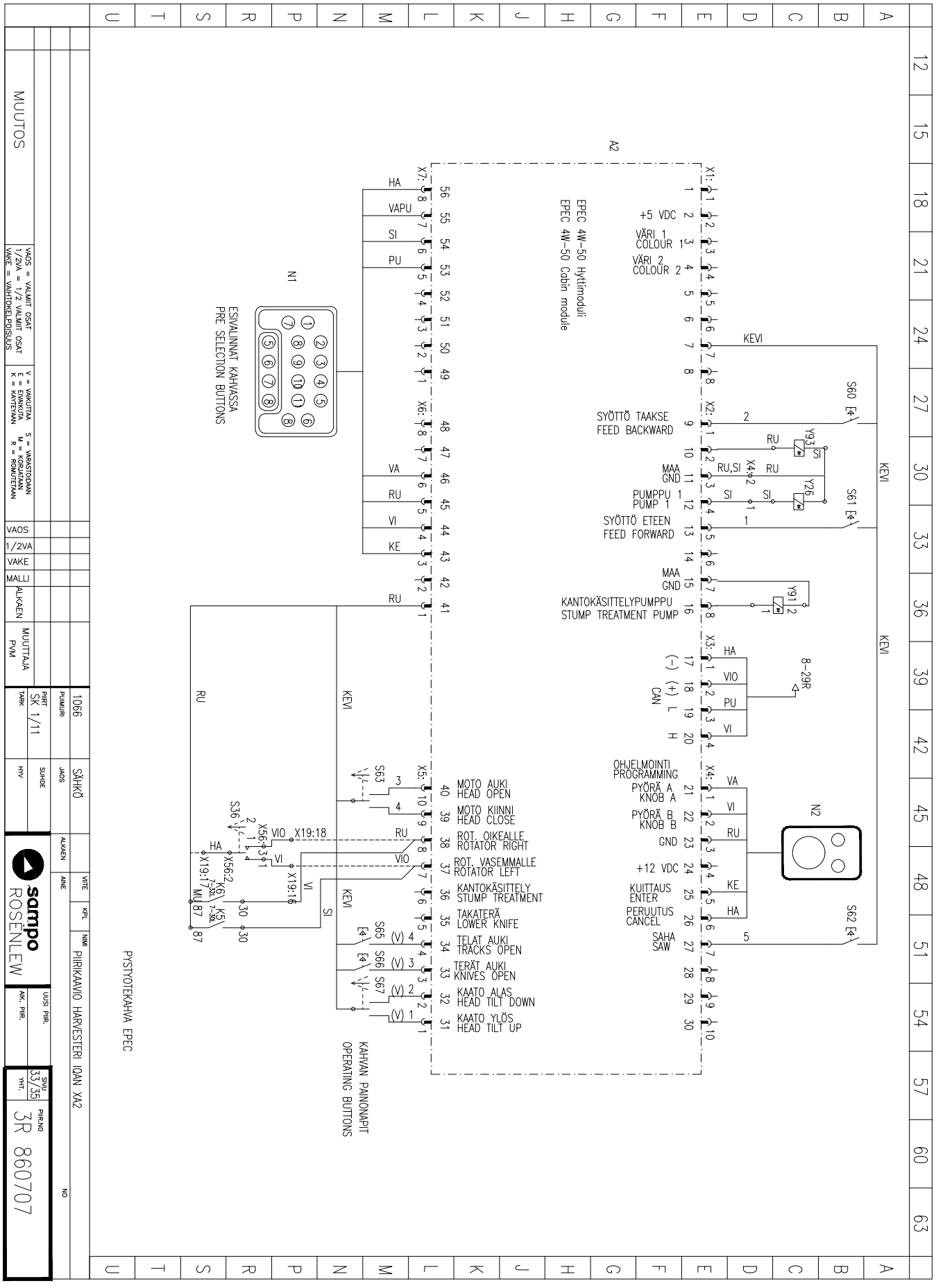
"NORMAALISSA" IQAN OHJELMASSA RELEET:
K5 OHJAA ROTAATTORIA VASEMMALLE
K6 OHJAA ROTAATTORIA OIKEALLE
K42 OHJAA KOURAN AUKI
K43 OHJAA KOURAN KIINNI
K51 OHJAA KOURAN TILTIN YLÖS
K52 OHJAA KOURAN TILTIN ALAS

MUUTOS	VAOS = VALMIIT OSAT 1/2VA = 1/2 VALMIIT OSAT VAKE = VAIHTOKELPOISUUS	V = VAIKUTTAA S = VARASTOIDAAN E = EIVAIKUTA M = KORJATAAN K = KAYTEYAAN R = ROMUTETAAN	SOVA	1/2VA	VAKE	NÄYTT	ALKAEN	MUUTTAJA PVM

1066	SÄHKÖ		VIITE	KPL	NIMI	MOTOMIT MCKC 03-MODULE / EXCIDOR NÄPPÄIMISTÖ / KETO & FORESTERI	
PUIMURI	JAOS	ALKAEN	AINE	PIIRIKAAVIO IQAN XA2			NO
PIIRT TL 10.10.2006	SUHDE		UUSI PIIR.		SIVU 31/35	PIIR.NO 3R 860707	
TARK	HYV		AIK. PIIR.		YHT.		

SAMPO ROSENLEW


EPEC 4W-50 Hyttimoduli
EPEC 4W-50 Cabin module
ESIVALINNAT
PRE SELECTION BUTTONS
KAHVAN PAINONAPIT
OPERATING BUTTONS
EMETÄN KAHVAT EPEC
+5 VDC
VÄRI 1 COLOUR 1
VÄRI 2 COLOUR 2
SYÖTTÖ TAAKSE FEED BACKWARD
SYÖTTÖ ETEEN FEED FORWARD
PUMPPU 1 PUMP 1
MAA GND
KANTOKÄSITTELYPUMPPU STUMP TREATMENT PUMP
CAN
OHJELMOINTI PROGRAMMING
PYÖRÄ A KNOB A
PYÖRÄ B KNOB B
+12 VDC
KUITTAUS ENTER
PERUUTUS CANCEL
SAHA SAW
MOTO AUKI HEAD OPEN
MOTO KIINNI HEAD CLOSE
ROT. OIKEALLE ROTATOR RIGHT
ROT. VASEMMALLE ROTATOR LEFT
KANTOKÄSITTELY STUMP TREATMENT
TAKATERÄ LOWER KNIFE
TELAT AUKI TRACKS OPEN
TERÄT AUKI KNIVES OPEN
KAATO ALAS HEAD TILT DOWN
KAATO YLÖS HEAD TILT UP
MUUTOS
MUUTTAJA PVM
ALKAEN
MALLI
VAKE
1/2VA
VAOS
VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS
V = VAKUUTTAA
E = EHKÄISTÄÄN
K = KOSKETTAMAN
S = VARASTOIDAAN
M = MITOITTAMAN
K = KOSKETTAMAN
1066
PIIRT SK 1/11
SÄHKÖ
SUHDE
PIIRIKAAVIO HARVESTERI IQAN XA2
UUSI PIIR.
SIVU 32/35
YHT.
PIIR.NO 3R 86707
NO



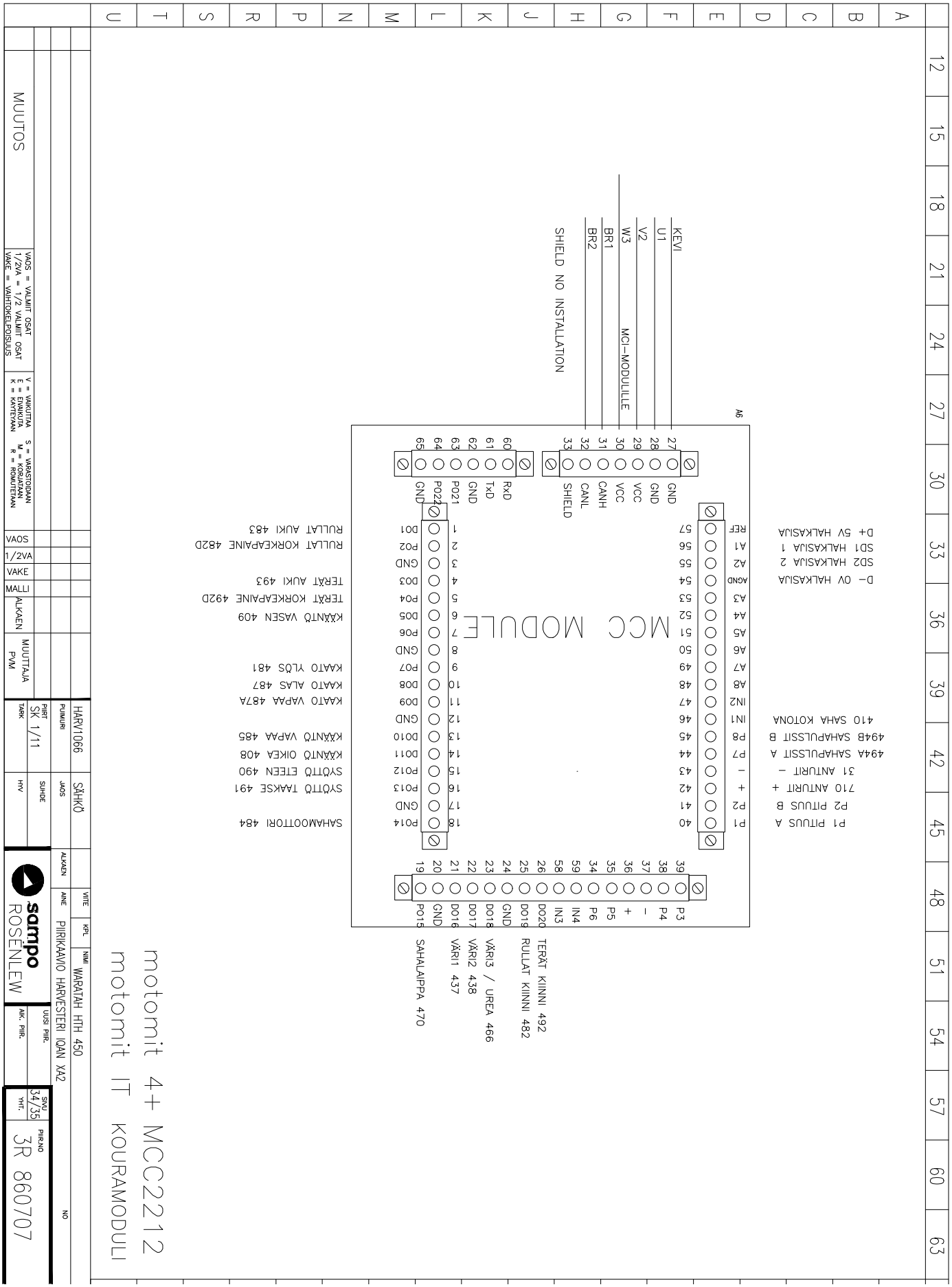
MUUTOS

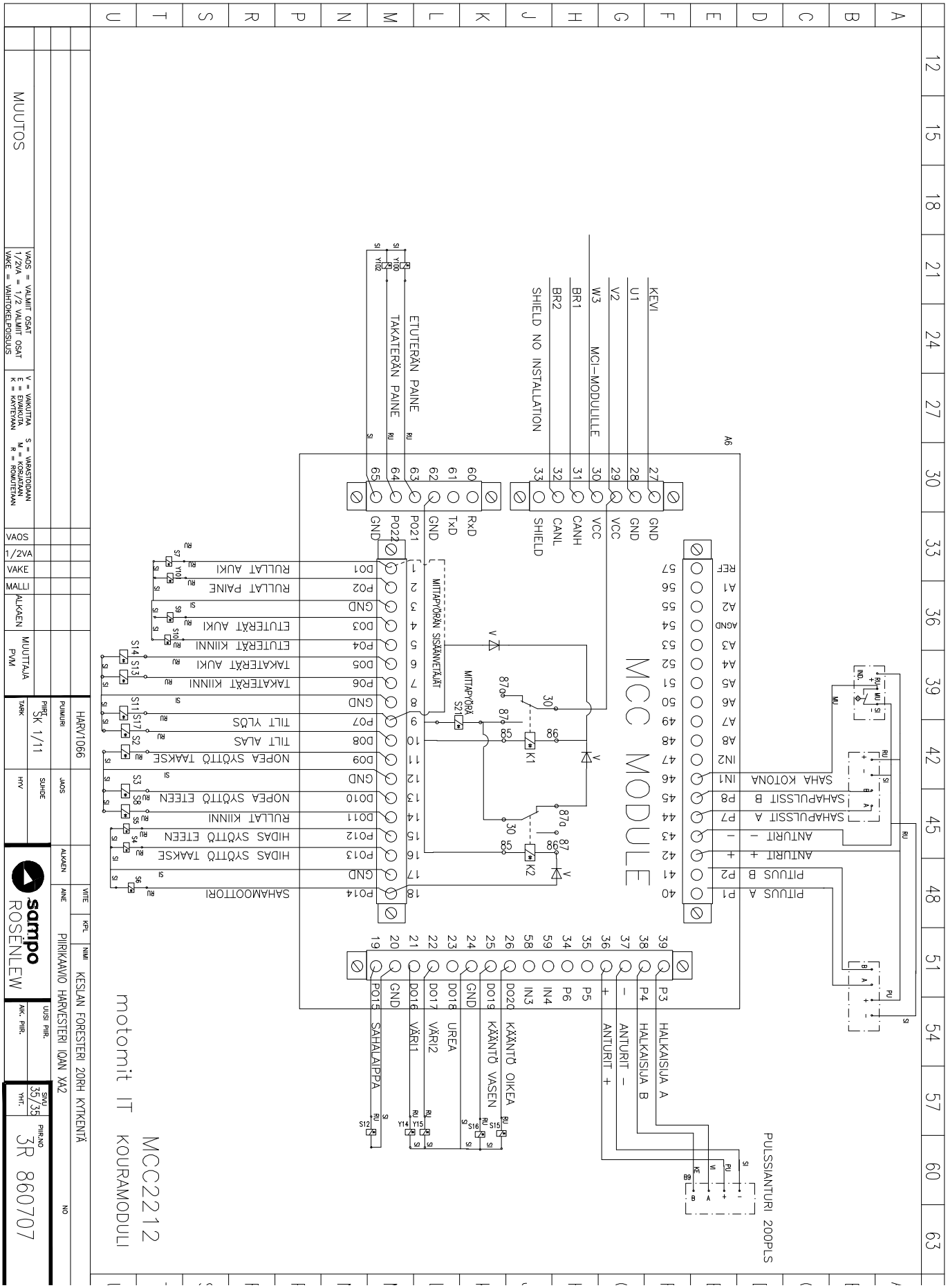
VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS

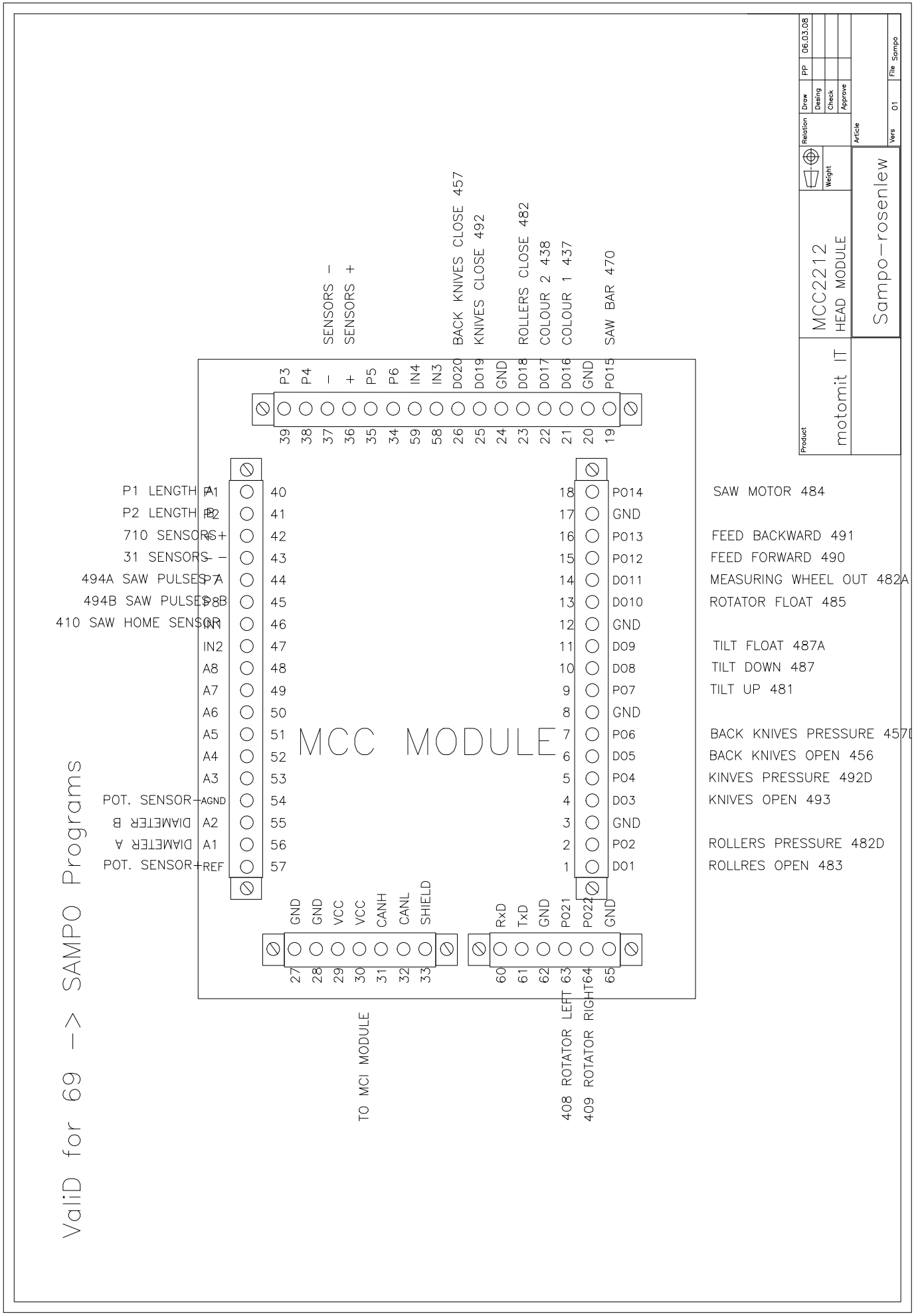
V = VARKUTTAA
E = EIVARKUTA.
K = KÄYTETÄÄN

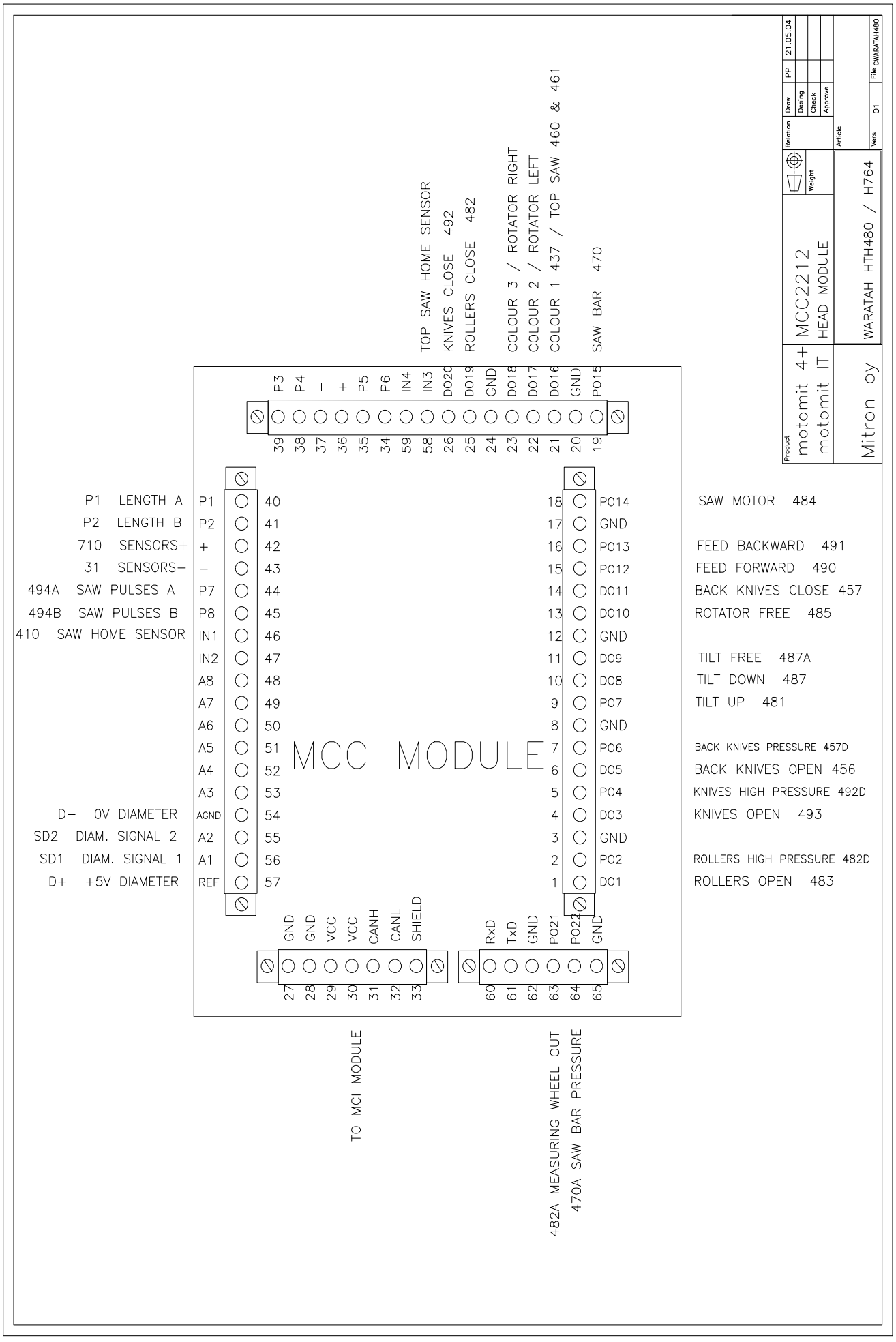
S = VARASTOIDAAN
M = KORJATTAAN
R = ROMUTETAAN

| | | |


motomit 4+ MCC2212
motomit IT KOURAMODULI
MCC MODULE
A6
KEVI
U1
V2
W3
MCI-MODUULILLE
BR1
BR2
SHIELD NO INSTALLATION
GND
GND
VCC
VCC
CANH
CANL
SHIELD
RxD
TxD
GND
P021
P022
GND
D- 0V HALKASIJA
SD2 HALKASIJA 2
SD1 HALKASIJA 1
D+ 5V HALKASIJA
P1 PITUUS A
P2 PITUUS B
710 ANTURIT +
31 ANTURIT -
494A SAHAPULSSIT A
494B SAHAPULSSIT B
410 SAHA KOTONA
P3
P4
-
+
P5
P6
IN4
IN3
D020
D019
GND
D018
D017
D016
GND
P015
TERÄT KIINNI 492
RULLAT KIINNI 482
VÄRI3 / UREA 466
VÄRI2 438
VÄRI1 437
SAHALAIPPA 470
P014
GND
D013
D012
D011
D010
GND
D09
D08
P07
GND
P06
D05
D04
D03
GND
P02
D01
SAHAMOOTTORI 484
SYÖTTÖ TAKSE 491
SYÖTTÖ ETEEN 490
KÄÄNTÖ OIKEA 408
KÄÄNTÖ VAPAA 485
KAATO VAPAA 487A
KAATO ALAS 487
KAATO YLÖS 481
KÄÄNTÖ VASEN 409
TERÄT KORKEAPAINE 492D
TERÄT AUKI 493
RULLAT KORKEAPAINE 482D
RULLAT AUKI 483
MUUTOS
VAOS = VALMIIT OSAT
1/2VA = 1/2 VALMIIT OSAT
VAKE = VAIHTOKELPOISUUS
V = VAIKUTTAA
E = ELVAKUTA
K = KAYTEYAAN
S = VARASTOIDAAN
M = KORJATAAN
R = ROMUTETAAN
VAOS
1/2VA
VAKE
MALLI
ALKAEN
MUUTTAJA
PVM
HARV1066
SÄHKÖ
PUMURI
JAOS
SUHDE
PIIRT
TARK
SK 1/11
HYV
ALKAEN
VITTE
ANE
KPL
NIMI
PIIRIKAAVIO HARVESTERI IQAN XA2
WARATAH HTH 450
ROSENLEW
ULUSI PIIR.
AIK. PIIR.
SIVU
34/35
YHT.
PIIR.NO
3R 860707
NO


MCC MODULE
MCC2212
motomit IT KOURAMODULI
KESLAN FORESTERI 20RH KYTKENTÄ
PIIRIKAAVIO HARVESTERI IQAN XA2
HARV1066
3R 860707
MUUTOS
ETUTERÄN PAINE
TAKATERÄN PAINE
MCI–MODUULILLE
MITTAPYÖRÄN SISÄÄNVETÄJÄT
MITTAPYÖRÄ
SAHA KOTONA
SAHAPULSSIT B
SAHAPULSSIT A
ANTURIT –
ANTURIT +
PITUUS B
PITUUS A
PULSSIANTURI 200PLS
HALKAISIJA A
HALKAISIJA B
ANTURIT –
ANTURIT +
KÄÄNTÖ OIKEA
KÄÄNTÖ VASEN
UREA
VÄRI2
VÄRI1
SAHALAIPPA
RULLAT AUKI
RULLAT PAINE
ETUTERÄT AUKI
ETUTERÄT KIINNI
TAKATERÄT AUKI
TAKATERÄT KIINNI
TILT YLÖS
TILT ALAS
NOPEA SYÖTTÖ TAAKSE
NOPEA SYÖTTÖ ETEEN
RULLAT KIINNI
HIDAS SYÖTTÖ ETEEN
HIDAS SYÖTTÖ TAAKSE
SAHAMOOTTORI


Product
motomit IT
MCC2212
HEAD MODULE
Sampo-rosenlew
Article
Weight
Relation
Draw
Dealing
Check
Approve
PP
06.03.08
Vers
01
File Sampo
MCC MODULE
P1 LENGTH A
P2 LENGTH B
710 SENSORS +
31 SENSORS –
494A SAW PULSES A
494B SAW PULSES B
410 SAW HOME SENSOR
POT. SENSOR AGND
DIAMETER B
DIAMETER A
POT. SENSOR REF
SENSORS –
SENSORS +
BACK KNIVES CLOSE 457
KNIVES CLOSE 492
ROLLERS CLOSE 482
COLOUR 2 438
COLOUR 1 437
SAW BAR 470
SAW MOTOR 484
FEED BACKWARD 491
FEED FORWARD 490
MEASURING WHEEL OUT 482A
ROTATOR FLOAT 485
TILT FLOAT 487A
TILT DOWN 487
TILT UP 481
BACK KNIVES PRESSURE 457D
BACK KNIVES OPEN 456
KINVES PRESSURE 492D
KNIVES OPEN 493
ROLLERS PRESSURE 482D
ROLLRES OPEN 483
TO MCI MODULE
408 ROTATOR LEFT
409 ROTATOR RIGHT
ValiD for 69 -> SAMPO Programs


Product
motomit 4+ MCC2212
motomit IT HEAD MODULE
Mitron oy
WARATAH HTH480 / H764
Article
Relation
Weight
Draw PP 21.05.04
Dasing
Check
Approve
Vers 01
File CWARATAH480
MCC MODULE
P1 LENGTH A
P2 LENGTH B
710 SENSORS+
31 SENSORS–
494A SAW PULSES A
494B SAW PULSES B
410 SAW HOME SENSOR
D– 0V DIAMETER
SD2 DIAM. SIGNAL 2
SD1 DIAM. SIGNAL 1
D+ +5V DIAMETER
TOP SAW HOME SENSOR
KNIVES CLOSE 492
ROLLERS CLOSE 482
COLOUR 3 / ROTATOR RIGHT
COLOUR 2 / ROTATOR LEFT
COLOUR 1 437 / TOP SAW 460 & 461
SAW BAR 470
SAW MOTOR 484
FEED BACKWARD 491
FEED FORWARD 490
BACK KNIVES CLOSE 457
ROTATOR FREE 485
TILT FREE 487A
TILT DOWN 487
TILT UP 481
BACK KNIVES PRESSURE 457D
BACK KNIVES OPEN 456
KNIVES HIGH PRESSURE 492D
KNIVES OPEN 493
ROLLERS HIGH PRESSURE 482D
ROLLERS OPEN 483
TO MCI MODULE
482A MEASURING WHEEL OUT
470A SAW BAR PRESSURE

ELECTRICAL PARTS
R860707 1066
TUNN. Description
A1 EPEC 4W-50 HUB (hub module), keto
A1 EPEC 4W-50 HUB (hub module), kesla
A2 EPEC 4W-50 Cabin module, keto
A2 EPEC 4W-50 Cabin module, kesla
A3 EPEC Head module version keto 12.46
A3 EPEC Headmodule version keto 12.53
A3 EPEC Headmodule version keto 1.25
A3 EPEC Headmodule kesla
A4 Mitron MCI IT motomit4 module
A5 Mitron MCKC03 switch module
A6 Mitron MCC Head module
A7 Dasa module
A8 Epec 4W30 Cabin module
B2 Temperature sensor hydraulic oil tank
B3 temperature sensor motor
B5 Fuel sensor
B6 Inductive sensor perambulator
B7 Inductive sensor perambulator
B8 Inductive sensor saw home
B9 Pulse sensor diameter
B10 Inductive sensor saw
B11 Inductive sensor saw
B12 Foot pedal
B13 driving speed potentiometer
B14 hydraulics temperature sensor gear box
B15 Hall sensor left back hydraulicmotor
B16 Hall sensor right back hydraulicmotor
B17 Hand throttle
B18 Cabin tilt sensor sideways
B19 Cabin tilt sensor front/back
B20 Body-link angle sensor
B21 Gearbox speed sensor
B97 Pressure sensor
B98 Pressure sensor
B99 Pressure sensor
B100 Pressure sensor

C1 Capacitor 1000 Mikro F A4 printer

E1 worklight top
E2 worklight top
E3 worklight top
E4 worklight top
E5 worklight extra light
E6 worklight left door
E7 worklight right door
E8 worklight cabin front module left
E9 worklight cabin front module right
E10 worklight drivelightarm right
E11 worklight drivelightarm left
E12 boom bottom light left
E13 boom bottom light right
E14 roof light left side back
E15 roof light right side back
E16 roof light left side front
E17 roof light right side front
E18 roof light left front angle
E19 roof light right front angle
E20 roof light left front middle
E21 roof light right front middle
E22 roof light left front inside
E23 roof light right front inside
E24 roof light left back angle
E25 roof light right back angle

E27 worklight motor room

E29 rotator light
E30 blinker right front
E31 blinker right back
E32 blinker left back
E33 blinker left front
E34 park light left front
E35 park light right front
E36 park light left back
E37 park light right back
E38 drive light left
E39 drive light right
E40 drive light long left
E41 drive light long right
E42 cabin inside light
E43 light gauge, hydr.temp
E44 light gauge, fuel
E45 light gauge, engine temp.
E46 light, cabin temp. panel
E47 boom bottom light left
E48 boom bottom light right

1F1 Fuse,blinker left
1F2 fuse, blinker right
1F3 fuse, park light
1F4 fuse, backlight meter
1F5 fuse, headlamp left
1F6 fuse, headlamp right
1F7 fuse, headlamp long left
1F8 fuse, headlamp long right

2F1 fuse, radio,cabin inside,EHS(gearbox)

2F2 fuse, working light relays
2F3 fuse, 24V male, hazard
2F4 fuse, rotate blinker
2F5 fuse, blinker
2F6 fuse, windscreen wiper
2F7 fuse, brake,body-link lock, CTA control
2F8 fuse, lubrication

3F1 fuse, fan,AC
3F2 fuse, horne
3F3 fuse, seat
3F4 fuse, main relays,measuring device,iqan control
3F5 fuse, meter, warning light
3F6 fuse, PC voltage reduce
3F7 fuse, fire protection
3F8 fuse, automatic lubrication system

4F1 fuse, working light crane
4F2 fuse, working light
4F3 fuse, working light
4F4 fuse, working light
4F5 fuse, working light
4F6 fuse, working light
4F7 fuse, working light door left, right
4F8 fuse, working light more light

5F1 fuse, main circuit K3 +15
5F2 fuse, working light front at the bottom right, left
5F3 fuse, main circuit K7 +15
5F4 fuse, main circuit ignition key +30
5F5 fuse, AC
5F6 fuse, measuring device
5F7 fuse, cabin connector X39:1
5F8 fuse, IQAN XA2:AO

6F1 fuse, main fuse, IQAN control, fuel pumps and valve
6F2 fuse, IQAN XT2-A1
6F3 fuse, IQAN XA2:A1
6F4 fuse, negative pressure pump
6F5 fuse, cabin connector X39:2
6F6
6F7 fuse, hydraulics pump solenoid
6F8 fuse, cabin connector X39:3

7F1 fuse, male cabin front
7F2 fuse, PC preheater
7F3 fuse,
7F4 fuse,
7F5 fuse,
7F6 fuse,
7F7 fuse,
7F8 fuse, measuring device Dasa +30

8F1 fuse, fire protection
8F2 fuse, IQAN MD3 näyttö
8F3 fuse, engineroom light
8F4 fuse, motorheater more pump
8F5 fuse, fuel pump male.
8F6 fuse, motorheater fan
8F7 fuse, motorheater
8F8 fuse, motorheater clock

9F2 fuse, hydraulic motor sensor rpm
9F3 fuse, CTA ignition key +15
9F4 fuse, fuel lift pumps
9F5
9F6 fuse,
9F7
9F8 fuel sensor

10F1 fuse, IQAN XA2:A0
10F2 Fuse, Iqan joystic
10F3 fuse, IQAN MD3 display +15

11F1 fuse,X31:1
11F2 fuse, crane move end slow
11F3 fuse, IQAN XA2:A1

12F1 fuse, gearbox EHS
12F2 fuse, gearbox EHS

13F1 fuse, glow

14F1 fuse, PC
14F2 fuse, printer
14F3 Fuse, phone/Sunit modem
15F1 Fuse, CTA CommonRail

G1 battery
G2 battery
G3 generator
G4 generator

H1 warning light

H11 horne
H12 signal light, hydraulicsoil height level
H16 signal light, parking brake
H2 signal light, charge 1
H20 signal light charge 2
H3 signal light motor oil pressure
H4 signal light, motor temperature

H5 signal light, hydraulicsoil filter
H6 signal light, hydraulics oil temperature
H7 signal light headlamp long
H8 signal light, blinker
H9 signal light, hydraulics oil filter (drive)
H10 signal light, hydraulics oil filter (pressure)
H22
H23 signal light, motor air filter
H24 empty
H38 signal light CTA diagnostic
H31 signal light gear 1
H32 signal light, gear 2
H33 signal light, gear 3
H34 signal light, gear N
H35 signal light glow (CTA)
H36 Alarm light fire protection

K1 Relay, emergency stop
K10 Relay, drive/place
K11 Relay, warning
K12 Relay, working light

K15 Relay, start
K16 Relay, park brake
K17 Relay, working light

K19 Relay, working light
K2 Relay, working light crane
K27 Relay, warning enter
K29 Relay, back brake
K3 Relay, AC,fan,seat main circuit
K30 Relay, working light door
K31 Relay, more working light
K32 Relay, AC
K33 Relay, hydraulics oil height level
K36 Relay, measuring device
K37 Relay, IQAN
XA2-AO,LX0-LX1,MD3
K38 Relay, IQAN XA2-A1
K4 Relay, blinker
K42 Relay, head open IQAN
K43 Relay head close IQAN
K48 Relay, hydraulics oil pump
K49 Solenoid oil pump
K5
K51 Relay, fall up IQAN
K52 Relay, fall down IQAN
K6
K60
K61
K72 Relay, front brake
K74 Relay, windscreen single-shot sweep
K75 Relay,gear move pressure
K7 Relay, +15
K8 Relay, working light cabin up side , back upper
K9 Relay, working light cabin up side , back upper
K91 Relay, working light front
K92 Solenoid glow
K100 relay, fuel lift pump

K104 Relay, motorheater fan control
K105 Relay, motorheater more water-pump control
K106 Relay, IQAN XT2-A1
K107 Relay, CTA,ign, fuel pump
K109 Relay, gear on
K110 Relay, rear brake

M1 Start motor
M2 motor, windscreen
M3 motor, windscreen wash
M4 motor, fan
M5 motorheater more heater fuel pump
M6 motorheater more heater waterl pump
M7 motor, hydraulics negativepressure pump
M8 motor, fuel pump more pump
M10 motor, hydraulics pump
M11 motorheater
M12 seat air kompressor

N1 switchbox, preselection
N2 mouse
P1 Display 4W50.keto
P2 Display 4W50.kesla
P3 Display 4W30.keto
P4 meter, motor temperature
P5 meter, hydraulics oil temperature
meter, fuelmeter
Q1 electrical mainswitch

S1 switch, main circuit control

S10 switch, blinker

S11 switch, rotate blinker

S12 switch, light

S13 switch, windscreen
S14 switch, windscreen wash

S15 switch, horne

S16 switch, park brake

S17 switch, seatheater

S18 switch, fan
S19 switch, AC control

S20 Pressure switch AC kompressor
S21 switch inside light
S22 switch working light front

S23 switch, working light

S24 switch, body.lock 0-1-A

S25 switch, workbrake

S26 switch, steering/load

S27 switch, steering/load
S28 limit switch, door measuring device
S29 pressureswitch filter (drive)
S30 pressureswitch filter

S32 limit switch, hydraulicsoil tank breather cock
S33 switch, four wheel

S37 switch light change

S38 switch, diagnostic

S40 switch, balance gear lock front

S44 switch, warning enter

S45 switch, cabin tilt back/tilt

S46 switch, cabin tilt sideways

S47 switch, cabin tilt automatic

S50 switch, measuring device

S51 switch, working light door

S52 limit switch, hydraulics oil height level

S53 switch, running direction

S6 ignition key

S8 switch, emergency stop

S9 switch, warning blinker

S90 switch,oil pump full
S91 limit switch, hydraulics height level
S92 limit switch, door, IQAN

S99 motor airfilter sensor
S100 switch, negative pressure pump
S101 switch, motor room light
S102 switch, electrical mainswitch
S103 limit switch, gear 1
S104 limit switch, gear 2
S105 limit switch, gear 3
S106 limit switch, move gear 1-N
S107 limit switch, move gear 2/3/N
S108 switch, gear selection 1-2
S109 switch, gear selection 3-N
S110 limit switch brake pressure
S111 switch, air seat

S114 pressure switch hydraulics drive pump
S115 crane end slow

R1 resistor, 1k ohm, radio memory
R2 resistor, 1k ohm, radio memory

R3 resistor, 120 ohm EHS CAN
R4 resistor, 120 ohm EHS CAN
R5 Glow resistor, 1,2kW

U2 voltage reducer, EHS
U3 voltage reducer, PC

V1 Diode, motor air filter
V2 Diode,
V3 Diode, chargelight 1
V5 Diode,
V6 Diode, warning hydraulics oil filter
V7 Diode, warning oil filter (drive)
V8 Diode, chargelight 2
V9 Diode, radio
V17 Diode, radio
V19 Diode, radio
V20 Diode, gear 1
V21 Diode, gear 2
V22 Diode, gear 3
V23 Diode, gear 2 and 3
V26 Diode, blinker signal light right
V27 Diode, blinker signal light left
V28 Diode, warning hydraulics oil temperature
V29 Diode, warning motor oil pressure
V30 Diode, warning motor temperature
V35 Diode, warning hydraulics oil height level
V39 Diode, windscreen wash
V40 Diode, horne
V42 Diode, warning blinker enter relay

V50 Diode, hydraulics pressure measuring device Y75,1
V51 Diode, hydraulics pressuremeasuring device Y75,2

Y1 Magnetic valve, body lock

Y11 Magnetic valve, steering left
Y12 Magnetic valve, steering right
Y13 Magnetic valve, front tilt out
Y14 Magnetic valve, front tilt in
Y15 Magnetic valve, extencion in
Y16 Magnetic valve, extencion out
Y2 Magnetic valve, park brake free
Y21 Magnetic switch, kompressor
Y23 Magnetic valve, balance gear lock front
Y24 Magnetic valve, four wheel release
Y3 Magnetic valve, rotate left

Y4 Magnetic valve, rotate right
Y5 Magnetic valve, lift down
Y6 Magnetic valve, lift up
Y7 Magnetic valve, tilt down
Y8 Magnetic valve, tilt up

Y70 Magnetic valve, park brake
Y71 Crane turn, brake
Y72 Magnetic valve, front brake
Y61 Magnetic valve, left hydraulics motor
Y62 Magnetic valve, left hydraulics motor
Y63 Magnetic valve, right hydraulics motor
Y64 Magnetic valve, right hydraulics motor
Y67 Magnetic valve, workpump angle
Y68 Magnetic valve, drive pump front
Y69 Magnetic valve, drive pump back
Y76 Magnetic valve, four wheel release work port
Y77 Magnetic valve, four wheel release work port
Y75,1 Magnetic valve, pressure 1
Y75,2 Magnetic valve, pressure 2
Y81 Magnetic valve, cabin right cylinder
Y82 Magnetic valve, cabin left cylinder
Y84 Magnetic valve, cavitation
Y91 Magnetic valve, gear 1
Y92 Magnetic valve, gear 2
Y93 Magnetic valve, gear 3
Y94 Magnetic valve, fuel closing cock
Y95 Magnetic valve, urine pump

X1:1 Diode, warning hydraulics oil filter
X1:2 Diode,
X1:3 Diode, warning oil filter (drive)
X1:4 Diode, warning hydraulics oil temperature
X1:5
X1:6 Diode, warning motor oil pressure
X1:7 Diode, warning motor temperature
X1:8
X1:9 Diode, warning hydraulics oil height level
X1:10 Diode, motor air filter

X1:11 Diode,
X1:12 Diode, warning blinker enter relay

X2:1 Diode, warning blinker enter relay
X2:2
X2:3 Diode, motor air filter
X2:4 Diode, warning hydraulics oil height level
X2:5
X2:6 Diode, warning motor oil pressure
X2:7 Diode, warning motor temperature
X2:8
X2:9 Diode, warning hydraulics oil temperature
X2:10 Diode, warning oil filter (drive)
X2:11 Diode,
X2:12 Diode, warning hydraulics oil filter

X6:1 resistor 1k ohm Radio memory
X6:2 resistor 1k ohm Radio memory

X10/12:1 supply radio 12V
X10/12:2 ground radio

X10/24:1 supply radio 24V
X10/24:2 ground radio

X11:1 more working light cabin front
X11:2
X11:3 left headlamp
X11:4 left headlamp long
X11:5 left blinker
X11:6 windscreen wash
X11:7 horne
X11:8
X11:9

X12:1 resistor 1k ohm Radio memory
X12:2 resistor 1k ohm Radio memory

X13.1 Relay, K9:87
X13.2 Relay, K9:87
X13.3 Relay, K17:87
X13.4 rotate blinker
X13.5 light inside
X13.6 switch door measuring device
X13.7 Relay, K8:87
X13.8 Relay, K8:87
X13.9 Relay, K19:87

X15:1 E16
X15:2 E14
X15:3 E24
X15:4 E18
X15:5 E20
X15:6 E22

X16:1 E17
X16:2 E15
X16:3 E25
X16:4 E19,E5
X16:5 E21
X16:6 E23

X17:1 blinker back right
X17:2 blinker back left
X17:3 park light back

X18:1 crane lights
X18:2 gearbox speedsensor, hydraulics pressure K75
X18:3 EHS supply 12V
X18:4 EHS supply, brake pressure, gearswitch
X18:5 back brake
X18:6 current front brake Y72
X18:7 park brake Y70
X18:8 front lock Y23
X18:9 hydraulicsmotor warning temperature

X19:1 supply seat kompressor
X19:2 ground seat kompressor

X20:1 supply seatheater
X20:2 ground seatheater

X21:1 start initiation current
X21:2 MD3and radio supply
X21:3 charge light 1
X21:4 charge light 2
X21:5 hydraulics oil warning height level
X21:6 motor oil pressure warning
X21:7 motor temperature warning
X21:8 motor temperature meter
X21:9 fuel meter

X22:1 vacuum filter pressure
X22:2 return filter pressure
X22:3 hydraulics oil temperature
X22:4
X22:5 motor airfilter warning
X22:6 blinker back right
X22:7 blinker back left
X22:8 hydraulics oil temperature

X22:9 reserve

X24:1 drivepump
X24:2 drivepump front Y68
X24:3 drivepump back Y69
X24:4 work pump
X24:5 work pump angle limit
X24:6 hydraulics pressure EHS K75
X24:7 four wheel signal light
X24:8
X24:9

x25:1 Diode, windscreen wash
x25:2 Diode, horne
x25:3 Diode, chargelight 1
x25:4 Diode, chargelight 2
x25:5
x25:6 Diode, blinker signal light right
x25:7 Diode, blinker signal light left
x25:8
x25:9 Diode, radio
x25:10 Diode, radio
x25:11 Diode, radio
x25:12

X26:1
X26:2 Diode, radio
X26:3 Diode, radio
X26:4 Diode, radio
X26:5
X26:6 Diode, blinker signal light right
X26:7 Diode, blinker signal light left
X26:8
X26:9 Diode, chargelight 2
X26:10 Diode, chargelight 1
X26:11 Diode, horne
X26:12 Diode, windscreen wash

X27:1 Drivepedal +Vref
X27:2 Drivepedal -Vref
X27:3 Drivepedal signal

X3:1 place/move control K10
X3:2 four wheel control XT2
X3:3
X3:4 supply XA2:AO K37
X3:5 supply XA2:A1 K38
X3:6 back brake Y2
X3:7 body lock Y1
X3:8 supply male X7
X3:9 four wheel signal light

X31:1
X31:2 crane move slow sensor
X31:3 XA2:A1

X32:1 more working light reserve cabin right front
X32:2 right front park light
X32:3 right headlamp
X32:4 right headlamp long
X32:5 right blinker
X32:6
X32:7
X32:8
X32:9 male supply X7

X33:1 working light door
X33:2 working light E1,E2,E3,E4

X35:1 Crane turn, brake Y71
X35:2 XA2-AO gear speed sensor

X37:1 clock switch light
X37:2 clock switch supply +15
X37:3 clock switch ground

X39:1 free supply 5F7
X39:2 free supply 6F5
X39:3 free supply 6F8

X42:1 P2 foot pedal supply +Vref
X42:2 P1 foot pedal supply +Vref
X42:3 P1 foot pedal ground -Vref
X42:4 P1 foot pedal signal
X42:5 P2 foot pedal ground -Vref
X42:6 P2 foot pedal signal
X42:7
X42:8
X42:9

X43:1 cabin tilt sensor side +Vref
X43:2 cabin tilt sensor signal
X43:3 cabin tilt sensor side ground

X44:1 cabin tilt sensor front/back +Vref
X44:2 cabin tilt sensor signal
X44:3 cabin tilt sensor front/back ground

X45:A hand throttle supply +Vref
X45:B hand throttle signal
X45:C hand throttle ground -Vref

X46:1 body angle sensor ground -Vref
X46:2 bodyt angle sensor supply +Vref
X46:3 body angle sensor signal

X47:1 electrical mainswitch (fire

protection brittle ground)
X47:2 diagnostic switch S38
X47:3 diacnostic signal light
X47:4 glow signal light
X47:5 supply control CTA,fuel more pump
X47:6 electrical mainswitch control
X47:7 electrical mainswitch control
X47:8 light back E36 JA E37
X47:9 AC control relay

X48:1 free wire 36 XA:1
X48:2 free wire 37 XA:4
X48:3 free wire 38 XA:5
X48:4 free wire 39 XA:6
X48:5 free wire 42 XA:34
X48:6
X48:7
X48:8 Free wire 50 XA:46
X48:9 free wire 51 XA:47

X49:1 free wire 40XA:32
X49:2 free wire 41 XA:33
X49:3 free wire 43 XA:39
X49:4 free wire 44 XA:40
X49:5 free wire 45 XA:41
X49:6 free wire 46 XA:42
X49:7 free wire 47 XA:43
X49:8 free wire 48 XA:44
X49:9 free wire 49 XA:45

X4:1 ground light left
X4:2 headlamp left
X4:3 headlamp right
X4:4 ground light
X4:5 male +24V
X4:6 ground male
X4:7 crane rotate left Y3
X4:8 crane rotate right Y4
X4:9 crane rotate
X4:10 crane lift up Y6
X4:11 crane lift down Y5
X4:12 crane lift
X4:13 crane tilt front Y8
X4:14 crane tilt back Y7
X4:15 crane tilt
X4:16 steering left Y11
X4:17 steering right Y12
X4:18 steering
X4:19 extencion out Y15
X4:20 extencion in Y16
X4:21 crane extencion
X4:22 front tilt back Y13
X4:23 front tilt front Y14
X4:24 crane tilt
X4:25
X4:26
X4:27
X4:28 headlamp long left
X4:29 headlamp long right
X4:30 blinker left
X4:31 blinker right
X4:32 park light left
X4:33 park light right
X4:34 ground, horne,windscreen wash
X4:35 windscreen wash
X4:36 work light K12
X4:37 work light K12
X4:38 horne
X4:39 crane move slow
X4:40 crane move slow
X4:41
X4:42
X4:43
X4:44
X4:45
X4:46
X4:47

White square-shaped connector
X5:1 Wiper motor ground
X5:2 Wiper motor return
X5:3 Wiper motor continuous
X5:4
X5:5 Wiper motor speed 2
X5:6 Wiper motor speed 1
Black round-shaped connector
X5:1 Wiper motor speed 1
X5:2 Wiper motor continuous
X5:3 Wiper motor return
X5:4 Wiper motor speed 2
X5:5 Wiper motor ground

X50:1 iqan left joystic LX-1 DI A
X50:2 iqan left joystic LX-1 DI B
X50:3 iqan left joystic LX-1 DI C
X50:4 iqan left joystic LX-1 DI D
X50:5 iqan left joystic LX-1 DI E
X50:6 iqan left joystic LX-1 DI F
X50:7 iqan left joystic LX-1 -VREF
X50:8 iqan left joystic LX-1 +VREF
X50:9 iqan left joystic LX-1 +BAT

X51:1 iqan right joystic LX-0 DI A
X51:2 iqan right joystic LX-0 DI B
X51:3 iqan right joystic LX-0 DI C
X51:4 iqan right joystic LX-0 DI D
X51:5 iqan right joystic LX-0 DI E
X51:6 iqan right joystic LX-0 DI F
X51:7 iqan right joystic LX-0 -VREF
X51:8 iqan right joystic LX-0 +VREF
X51:9 iqan right joystic LX-0 +BAT

X52:1 iqan left joystic LX-1 DI A
X52:2 iqan left joystic LX-1 DI B
X52:3 iqan left joystic LX-1 DI C
X52:4 iqan left joystic LX-1 DI D
X52:5 iqan left joystic LX-1 DI E
X52:6 iqan left joystic LX-1 DI F
X52:7 iqan left joystic LX-1 -VREF
X52:8 iqan left joystic LX-1 +VREF
X52:9 iqan left joystic LX-1 +BAT
X52:10 iqan left joystic LX-1 VI A
X52:11 iqan left joystic LX-1 VI B
X52:12 iqan left joystic LX-1 -BAT

X53:1 iqan right joystic LX-0 DI A
X53:2 iqan right joystic LX-0 DI B
X53:3 iqan right joystic LX-0 DI C
X53:4 iqan right joystic LX-0 DI D
X53:5 iqan right joystic LX-0 DI E
X53:6 iqan right joystic LX-0 DI F
X53:7 iqan right joystic LX-0 -VREF
X53:8 iqan right joystic LX-0 +VREF
X53:9 iqan right joystic LX-0 +BAT
X53:10 iqan right joystic LX-0 VI A
X53:11 iqan right joystic LX-0 VI B
X53:12 iqan right joystic LX-0 -BAT

X54:1 iqan left joystic LX-1 +VREF
X54:2 iqan left joystic LX-1 VI A
X54:3 iqan left joystic LX-1 -VREF

X55:1 iqan left joystic LX-1 +VREF
X55:2 iqan left joystic LX-1 VI A
X55:3 iqan left joystic LX-1 -VREF

X56:1 CommonRail supply
X56:2 CommonRail supply
X56:3 CommonRail supply
X56:4 CommonRail supply

X61:1 measuring device +
X61:2 measuring device -
X61:3 measuring device supply in battery 7F8

X62:1 hydraulics pressure Y75,1
X62:2 hydraulics pressure Y75,2
X62:3 hydraulics pressure Y75,1 ground
X62:4 hydraulics pressure Y75,2 ground
X62:5
X62:6
X62:7 PC display preheater
X62:8 Free wire 37 in main fuse box
X62:9 fire protection, power supply from battery

X7:1 male +24V
X7:2 male -24V
X8:1 male +24V
X8:2 male -24V

X9/12:1 male +12V
X9/12:2 male -12V

X9/24:1 male +24V
X9/24:2 male -24V

x100:1 windscreen single-shot sweep (switch)
x100:2 windscreen single-shot sweep (ground)

X102:1 blinker rotate supply
X102:2 blinker rotate ground

X103:1
X103:2 switch ground (steering/load)
X103:3 switch supply (steering/load)

113:1
113:2 IQAN XT2 -VREF
113:3 IQAN XT2 +VREF
113:4 IQAN XT2 (C1:39)
113:5 free wire 63 mainfusebox
113:6 free wire 62 mainfusebox
113:7 measuring device supply in battery
113:8 supply fan relay K104 in
113:9 supply fan relay K104 out

XA:1 free wire 36 X48:1
XA:2 chargelight 2
XA:3 chargelight 1
XA:4 free wire 37 X48:2
XA:5 free wire 38 X48:3
XA:6 free wire 39 X48:4
XA:7 motor temperature meter
XA:8 mdm and rasio supply memory
XA:9 CAN busCTA Can HI
XA:10 CAN bus CTA Can Lo
XA:11 CTA diagnostic switch S38
XA:12 CTA diagnostic signal light S38
XA:13 glow signal
XA:14 fuel meter
XA:15 blinker back right

XA:16 blinker back left
XA:17 park light back left right
XA:18 hydraulics oil temperature warning
XA:19 hydraulics oil temperature meter
XA:20 return filter warning
XA:21 motor air filter warning
XA:22 hydraulics oil height level warning
XA:23 AC relay control
XA:24 clockswitch
XA:25 clockswitch
XA:26 clockswitch supply
XA:27 supply CTA fuel more lift pump
XA:28 electrical mainswitch control
XA:29 reserve
XA:30 electrical mainswitch control
XA:31 air filter warning
XA:32 free wire 40 X49:1
XA:33 free wire 41 X49:2
XA:34 free wire 42 X48:5
XA:35 start relay control
XA:36 electrical mainswitch control
XA:37 motor oil pressure warning
XA:38 motor oil temperature warning
XA:39 free wire 43 X49:3
XA:40 free wire 44 X49:4
XA:41 free wire 45 X49:5
XA:42 free wire 46 X49:6
XA:43 free wire 47 X49:7
XA:44 free wire 48 X49:8
XA:45 free wire 49 X49:9
XA:46 free wire 50 X48:8
XA:47 free wire 51 X48:9

XA1:1 AC relay control
XA1:2 AC pressure switch
XA1:3 start relay control
XA1:4 electrical mainswitch control
XA1:5 electrical mainswitch control

XA2:1 clockswitch
XA2:2 clockswitch
XA2:3 clockswitch supply
XA2:4 supply CTA fuel more lift pump
XA2:5 electrical mainswitch control
XA2:6 electrical mainswitch control

XA3:1 fuel sensor supply
XA3:2 fuel sensor ground
XA3:3 fuel sensor signal
XA3:4

XA4/XB4:1 supply drivepump pressureswitch and fuel close valve
XA4/XB4:2 ground fuel valve
XA4/XB4:3 hydraulics breather valve closed signal

XA5:1 hydraulics oil down level sensor ground
XA5:2 hydraulics oil down level sensor supply

XA6:1 hydraulics breather valve switch supply
XA6:2 hydraulics breather valve switch supply (pump)

XB:1 PC display preheater
XB:2 free wire
XB:3 free wire
XB:4 free wire XT2-A1 VI J / FI C
XB:5 four wheel control XT2
XB:6 place / move control K10
XB:7
XB:8 XT2-A1 +VREF
XB:9 XT2-A1 -VREF
XB:10 XA2-A1 CAN HI
XB:11 XA2-A1 CAN LO
XB:12 hydraulics pressure supply Y75;1
XB:13 hydraulics pressure supply Y75;2
XB:14 work pump
XB:15 work pump angle limit
XB:16 drive pump
XB:17 drive pump front Y68
XB:18 drive pump
XB:19 drive pump back Y69
XB:20 body lock Y1
XB:21 back brake Y2
XB:22 hydraulics pressure ground Y75,1
XB:23 hydraulics pressure ground Y75,2
XB:24 measuring device supply in battery
XB:25 supply XA2-A0 K37
XB:26 supply XA2-A1 K38
XB:27 supply fan
XB:28 supply fan
XB:29 supply male X7
XB:30 XT2 control circuit
XB:31 automatic fire protection

XB1:1 measuring device supply in battery
XB1:2 supply XA2-A0 K37
XB1:3 supply XA2-A1 K38
XB1:4 supply fan
XB1:5 supply fan

XB2:1 supply male X7

XB2:2 free wire 37 main fuse box
XB2:3 automatic fire protection
XB2:4 PC display preheater
XB2:5 free wire
XB2:6 free wire

XB3:1 Iqan XT2 supply
XB3:2 fuelpumps,valve,CTA+15ignition
XB3:3
XB3:4

XC:A working light supply K19 4F6
XC:B working light supply K30 4F7
XC:C working light supply K31 4F8
XC:D working light supply K8 4F4
XC:E working light supply K12 4F2
XC:F measuring device supply K36
XC:G working light supply K91 5F2
XC:H working light supply K17 4F5
XC:J maincircuit supply +15 K7 5F3
XC:K working light supply K2 4F1
XC:L working light supply K9 4F3
XC:M free supply in cabin X39:1 5F7
XC:N maincircuit supply +30 5F4
XC:P free supply in cabin X39:2 6F5
XC:R free supply +15 K3 5F1
XC:S free supply in cabin X39:3 6F8

XD1:1 supply 8F7motorpreheater
XD1:2 ground motor preheater and more fuelpump
XD1:3 motor preheater control in cabin fan
XD1:4 more fuelpump control
XD1:5 motorpreheater diagnostic
XD1:6
XD1:7 motor preheater control K105
XD1:8

XD2:1 motor preheater more fuel pump +24V
XD2:2 motor preheater more fuel pump -24V

XD3:1 motor preheater more fuel pump +24V
XD3:2 motor preheater more fuel pump -24V

XD4:1 vacuum pump +24V
XD4:2 vacuum pump -24V

XD6:1 more fuel pump front sensor ground
XD6:2 more fuel pump front sensor

XD7:1 hydraulics oil sensor up
XD7:2 hydraulics oil sensor up

XD8:1 hydraulics oil pump thermistor ground
XD8:2

XD9:1
XD9:2

XD10:1
XD10:2

X115:1 crane light voltage
X115:2 crane light grounding
X115:3 crane light voltage
X115:4 crane light grounding

X116:1 CAN LOW MD3
X116:2 CAN HI MD3
X116:3 parking brake (VIN/B)
X116:4 crane slow limit switch, supply
X116:5 +BAT display 10F3 3A
X116:6 crane slow limit switch, signal

X117:1 Switch brake pressure, signal
X117:2 START SIGNAL (XVREFA1:8)
X117:3 -BAT MD3
X117:4 crane slow limit, supply

118:1 MD3 DIN-A/VIN-A
118:2 MD3 DIN-F/VIN-F
118:3 MD3 DIN-G/VIN-G
118:4 MD3 DOUT-A
118:5 MD3 +VREF

MD3 C2
X119:1 DIN-A/VIN-A
X119:2 parking brake (VIN/B)
X119:3 brake pressure VIN-C
X119:4 Start position ignition VIN.D
X119:5 USB -Vref
X119:6 USB
X119:7 USB
X119:8 MD3+ Vref
X119:9 crane move end slow
X119:10 MD3 DIN-F/VIN-F
X119:11 MD3 DIN-G/VIN-G
X119:12 MD3 Dout-A
MD3 C1

X120:1-BAT
X120:2CAN L XA2-A0
X120:3CAN L MEASURING DEVICE
X120:4CAN L SISU DIESEL
X120:5
X120:6
X120:7+RTC memory voltage
X120:8
X120:9CAN H SISU DIESEL
X120:10 CAN H MEASURING DEVICE
X120:11 CAN H XA2-A0
X120:12 voltage +15

X121:1CAN LOW XA2-A0/LX0
X121:2CAN HI XA2-A0/LX0
X121:3+BAT 10F2 3A +15
X121:4-BAT

122:1 CAN LOW XA2-A1/XT2
122:2 CAN HI XA2-A1/XT2

123:1
123:2 CAN HI LX0/XA2-A1
123:3
123:4
123:5
123:6 CAN LOW LX0/XA2-A1

X124:1CAN HI MD3/SISUDIESEL
X124:2CAN LO MD3/SISUDIESEL

125:1 CAN HI MEASURING DEVICE
125:2 CAN Low MEASURING DEVICE
125:3

X126:1Crane light left voltage
X126:2Crane light left ground

VrefA1:1 +Vref XA2:A1
VrefA1:2 -Vref XA2:A1
VrefA1:3 Gear on signal
VrefA1:4 Rear brake release Y2
VrefA1:5 Drive pedal signal
VrefA1:6 Ignition +15 Iqan XA2:A1
VrefA1:7 engine start +50 control
VrefA1:8 start Ignition +50
VrefA1:9 Gear on relay supply

VIN:1 differential lock control S40
VIN:2 Vin-G DIN-G FIN-G XA2:A1
VIN:3
VIN:4 Cout-F Dout-L XA2:A1
VIN:5
VIN:6
VIN:7
VIN:8 Cret-F + DIN-S XA2:A1
VIN:9

Vin Cout:1 VIN-H DIN-H /D FINB-XA2:A1
Vin Cout:2
Vin Cout:3
Vin Cout:4
Vin Cout:5
Vin Cout:6 CretB- /DIN-L XA2.A1
Vin Cout:7
Vin Cout:8 CretF - /DIN-T XA2:A1